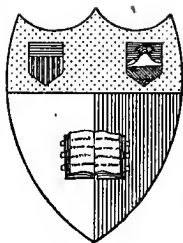


PSYCHOLOGY
AS-APPLIED-TO
EDUCATION

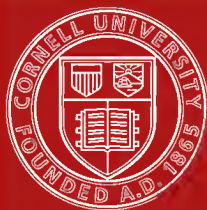
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PSYCHOLOGY

AS APPLIED TO

EDUCATION

BY

P. M. MAGNUSSON, PH.D.

STATE NORMAL SCHOOL
ST. CLOUD, MINNESOTA



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PREFACE

THIS book does not attempt to cover the whole field of modern psychology. Its scope is limited to those aspects of the vast subject which form the basis for rational education. It aims not only to present these principles in compact form, but also to show their practical application to the problems of the schoolroom.

This work has "grown up" in the classroom. There is scarcely a sentence in the book that has not been used repeatedly in the author's classes in psychology. The author has found it a good plan in his own teaching of the subject to require every pupil to bring to class a written summary of the previous lesson. At the beginning of each recitation there is a brief review and a few of the pupils read their written summaries. These summaries, besides being brief general statements, should also contain a liberal number of examples and illustrations.

In the recitations, the teacher should insist especially on these two points: (*a*) numerous and varied illustrations and examples, as it is only through the gate of the concrete that a saving knowledge of anything can ever be reached; and (*b*) exact and clear definitions, showing that the pupil has grasped the coördinating principles which underlie the concrete instances. To aid in this work, most chapters have appended a set of exercises that have been found helpful.

I cannot close this foreword without acknowledging my obligation to the friends and colleagues who have contributed ideas and inspiration for this work. I must refrain from mentioning names, except those of Miss Isabel Lawrence and Dr. Waite A. Shoemaker, President of the State Normal School at St. Cloud, Minnesota. Many of the essentials of this book are the result of sixteen years of professional intercourse with the well-poised and trenchant mind of Dr. Shoemaker.

P. M. MAGNUSSON

MARCH 1, 1913

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CHAPTER I

INTRODUCTION

VALUE OF PRACTICAL PSYCHOLOGY TO THE EDUCATOR

“ EDUCATION consists in the organizing of *resources* in the human being, of powers of conduct which shall fit him to his social and physical world, ” says William James. Thus, education has a twofold aspect: first, to develop what is in the individual to a harmonious whole, and second, to fit the individual into his place in society. But the individual is a bunch of human nature; and society is a bundle of such bunches of human nature. Hence it is evident that education is throughout a developing, organizing, and harmonizing of human nature.

It follows that psychology is the one indispensable science for him who would educate human beings, whether he be teacher or parent.

And still the paradox is true that probably no study has been more barren of results to the teacher than psychology. Less than a generation ago psychology had the same relation to teaching that the science of formal logic has to thinking. It was too abstract and theoretic to be useful. The subtle, speculative classifications and distinctions of psychology treated as a branch of metaphysics have no practical value to the teacher. Likewise modern laboratory psychology is, when “ taken straight, ” quite indigestible. The scientist who wishes

to specialize in psychology requires one kind of instruction, the teacher or parent quite another.

Thus it comes to pass that just as we have agricultural botany, industrial chemistry, and homiletic theology, we have developed an educational psychology. Here we leave ultimate questions of metaphysics unanswered, just as we do in every other practical science; not because such questions should not be answered or cannot be answered, but because metaphysics is of theoretic interest only. Here we busy ourselves with the highways of the science, follow the beaten paths, and ignore the byways and the frontier; because happily, as a rule, the useful is the obvious, and the commonplace is the most vital. And everywhere we look at questions primarily from the practical side. Our theoretic interest is only secondary.

The human mind is of practical interest to us as the source and explanation of human behavior. The simplest psychologic view of man is that he is *a sensitive organism that reacts*. Practical psychology is a study of what stimuli produce what reactions. It is a study of how human nature behaves. It is this practical side of psychology which is the especial interest of this book.

The great instrument of the mind is the nervous system. By means of the nervous system the mind controls the body and receives (through the senses) its knowledge of the material world. To the student of psychology, a knowledge of the nervous system* is invaluable. He should understand the structure of the great center of this system, the brain, and the structure

* See Appendix: *The Nervous System*.

of the spinal cord, and should be able to trace the course of a nerve current from its excitation by a stimulus to the producing of a reaction.

Practical psychology is the oldest science in the world and a science that all but hermits must study. Here we shall try to systematize, clarify, and make explicit what the reader has known and practiced all his life.

THE SUBJECT MATTER OF PSYCHOLOGY

"Cogito, ergo sum," "I think, therefore I exist," is the famous dictum of Descartes, which he made the corner stone of his philosophy. The expression has been much criticised. Scarcely any modern thinker is satisfied with it the way it stands; and still, somehow we cannot escape the grip of it. For, after all, we do know of our own existence in a direct and unqualified way. We are conscious of other objects, but we recognize ourselves as that which is conscious.

When we try to satisfy ourselves as to what consciousness is, we meet with more or less difficulty. It is easy to see that our voluntary acts are expressions of the mind, of consciousness. On the other hand, many of our acts are involuntary and seem to be operated by some mechanism within us, rather than by any conscious effort. It seems almost incredible that the same force loves, decides, imagines, yearns, feels pain and hunger, sends the blood coursing through the veins, digests food, and performs all the various functions of the body.

Yet there is overwhelming testimony to show that the human being is a unit and that it is the same force

— the mind, the self, consciousness — that acts in the highest and lowest processes of the human organism. Every swell of the emotions is recorded in the heart-beat; a fit of anger may impede and even stop digestion; and the thought of vinegar will stimulate the salivary glands to increased activity. Conversely, dyspepsia causes ill humor; and the presence of a little alcohol in the blood and in the nervous system will, for the time being, change a person's character and morals, thoughts and feelings. All the activities, from the highest reason to the lowest vital functions, are carried on by one and the same entity; there is a continuum all the way from our highest artistic aspirations to that within us which secretes the bile or sends the phagocytes to a wound.

However, only a very small part of our being is known to us by the *immediate* testimony of consciousness. The field of consciousness is very much like the field of vision. Only an infinitesimally small region is absolutely clear. This clear field is surrounded by a twilight zone of thoughts, feelings, and impulses that are but dimly perceived. The twilight zone gradually darkens as it extends out from the clear center until it is impossible to distinguish it from the absolute night of the absence of consciousness. Thus, because we cannot discover consciousness in a certain function, is no proof that it contains none. That organic functions of the body and reflex actions are expressions of consciousness is proved by the fact that they all respond to suggestion.

The subject matter of psychology is then the whole conscious human being. While, in order to under-

stand this conscious being, we must analyze it into its various states and processes, we should not lose sight of the fact that it is *one* force, not a series of separate forces.

THE THREE ASPECTS OF THE MIND

We act, we feel, we think. This is the time-honored division of mental phenomena. Here we must be careful not to allow a materialistic conception to creep in. We must not conceive the mind as three pigeon-holes, in one of which there are actions, in the next feelings, and in the last thought. Nor must we conceive the mind as a "three in one" tool, which can be used one moment for thinking and the next for action or feeling. For these are three aspects only of one and the same activity of the same mind. Every act of the mind involves the whole mind, and every act of the mind is motor, intellectual, and sentient. Only in thought may we make an artificial abstraction and think of one aspect apart from the rest. Just as we can easily think of one side of a sheet of paper, so we can think of the aspects of the mind separately. But we cannot carry away one side of a sheet of paper without also taking the opposite side along; nor can we think without feeling and motive, nor act without thought and feeling.

But though it is true that all three aspects of the mind are present in every act, it does not follow that the emphasis falls equally on all three. Thus one state of mind may be full of motive force, but be deficient in thought and feeling, as when a person of

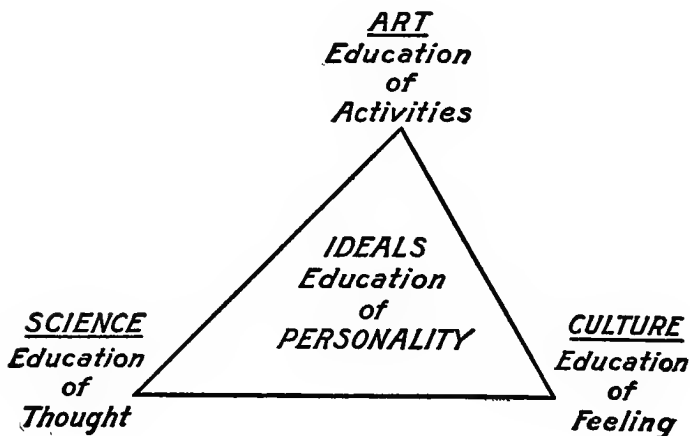
strong will persists in athletic practices. In solving a problem in algebra, intellect predominates and there is but a trace of motive and feeling.

Activity, sensibility, intelligence; to do, to feel, to know; motives, feelings, thoughts, — these are the three aspects of the mind, consciousness, human nature.

THE TRIANGLE OF EDUCATION

Since every human mind has these three aspects, education to be effective must develop the individual in each of these directions. The educated man is known by his trained and refined sensibilities and the coördination of his activities as well as by his capacity for clear thinking.

The following diagram illustrates the conception of complete education as conceived in this book : —



Exercises and Illustrations

1. (A Hindu example of aspect.) Around the market place are placed mirrors. In every mirror the same market place is seen. But there is a different scene in every mirror.

2. How much shorter the same distance looks from the bottom of the tower than from the top.

3. Expand the following examples of the three aspects of human nature. Tell which is most prominent in each.

a. Boy sees fish. Bait hook, lets down into water. Catch! Lands the fish. — Young man stands just under the eaves, makes his best bow to somebody. Snow on eaves loosens — falls — between collar and neck. Oh!

b. $6 \times 6 = 36$.

c. Singing a hymn.

4. Define the three aspects of the mind.

5. Diagrams that show the importance of viewpoint:—

The world as God knows it: 1 2 3 4 5 6 7 8 9

The world as you (1) perceive it: 1 2 3 4 5 6 7 8 9

What the world is to 9: 1 2 3 4 5 6 7 8 9

What 5 realizes of the world: 1 2 3 4 5 6 7 8 9

(A). The Intellect

CHAPTER II

SENSATION AND THE SENSES

SENSATION DEFINED

By means of the nervous system the mind and the material universe enter into relation. The nervous system is stimulated by external agencies, and the mind in reacting to such stimulation has sensations, feelings, and impulses.

Fundamentally and primarily the mental reaction to a sense stimulus is an *impulse to some motor activity*.

A certain degree of pleasure or pain accompanies the excitation of every impulse. Hence one aspect of every impulse is a *feeling*.

Again, if an impulse is far enough up in the light of consciousness, we *know* we have the impulse and the feeling. This aspect has been called a *sensation*.

Thus, the reaction of the mind to a sense stimulus has three aspects, and is at the same time an impulse, a feeling, and a sensation.

Considered as a cognitive process the mental reaction, then, may be called a *sensation*. The same mental event is called a *feeling* when we are concerned with the pleasure or pain of it, and an *impulse* when we think of its motor aspect.

A sensation is, then, the intellectual aspect of the reaction of the mind (consciousness) in response to a neural stimulus.

CLASSIFICATION OF THE SENSES

In order to respond perfectly to the stimulations of the external world, man has developed various senses, each of which is equipped with end-organs adapted to the receiving of some special kind of stimulus.

Thus, we have the sense of sight, whose sense organ, the eye, is adapted to the receiving of light waves, the sense of smell, whose sense organ, the nose, is sensitive to gases, and so on.

In the following classification we have differentiated the senses according to the stimuli which they are adapted to receive, and grouped them as to their relative importance in furnishing the mind with data for knowledge.

A. Special Senses.

I. The major special senses :—

1. The sense of sight.
2. The sense of hearing.
3. The sense of touch.
4. The motor sense.

II. The minor special senses :—

1. The sense of smell.
2. The sense of taste.
3. The sense of temperature.

B. Organic Senses. — From these we have such sensations as : pain from a wounded nerve, hunger, thirst, dizziness, feelings of health, energy, and fatigue.

We will consider first the various ways in which the nervous system is stimulated, and the organs for this purpose.

THE SENSE OF SIGHT

The eye is a camera, and the light reflected from the object before it, is focused on the rear wall of the

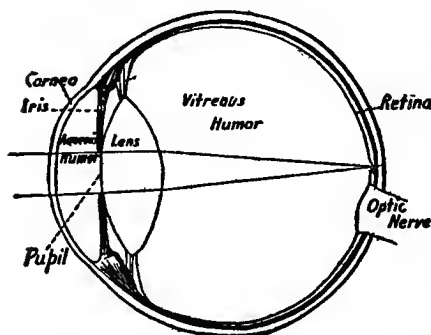


DIAGRAM OF A SECTION THROUGH THE EYEBALL

eye cavity, called the retina, and paints a small inverted image of the scene before the eye. The retina (which means *little net*) is a network of nerve endings of the optic nerve.

These end-organs of the optic nerve are curious curved rods and cones. The rods are filled with a substance called visual purple. This substance undergoes chemical decomposition rapidly when struck by light (but is very rapidly secreted again), and the energy of this chemical activity acts as a stimulus to the end-organs of the optic nerve, each one of which sends through its own nerve fiber a distinct current of neural energy to the occipital lobes of the brain. The optic nerves from the two eyes cross, and one branch goes to each occipital lobe, thus forming an X, and hence the name, the *optic chiasma*, from the Greek letter chi (X). But only half of the fibers from each eye cross to the opposite side, so half of the fibers of each

eye go to each occipital lobe. When the neural current arrives at the occipital lobes, some sort of change occurs — chemical or physical, or both — in the gray matter of the cortex at this place. This cerebral

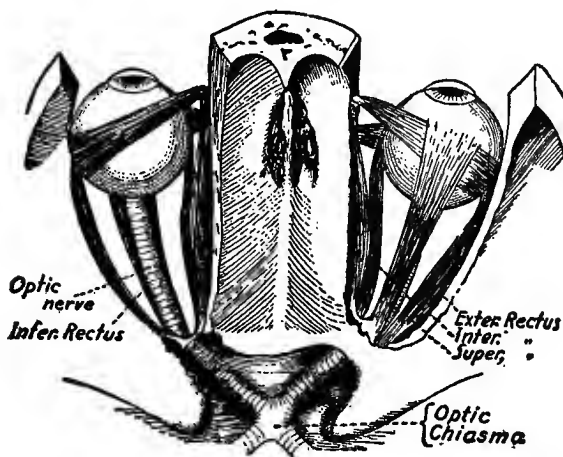


DIAGRAM SHOWING THE EYES IN POSITION IN THEIR SOCKETS

activity in the cortex of the occipital lobes causes a reaction of the mind which is known as the *sensation of light*.

The Sensation of Light. — Light, like all other sensations, has the attributes of quantity and quality. In quantity (intensity) it may be dim or bright. Its quality is known as *color*. There are three primary colors: red, blue, and yellow. These are primary because they have nothing in common. Different combinations and proportions of these three produce all other colors.

It seems that there are three sets of nerve endings of the optic nerve. One set is most sensitive to the upper reaches of the spectrum (violet), another to the middle (green), and the remaining to the lower end (red). The absence of one of these sets of nerve endings probably accounts for color blindness. Some have therefore held that red, green, and violet are primary colors. This, however, is an indefensible use of the term "primary colors," for green and violet both have the blue element, and red and violet have the red element in common.

THE SENSE OF HEARING

The inner ear is a labyrinthic cavity and is partly filled with a watery liquid. Here are the end-organs of the auditory nerves. The vibrations of physical

sound stimulate these end-organs, and the nerve reacts by sending a neural current to the auditory tract of the cortex of the brain, which is situated a little above and behind the ear. The neural event in the auditory tract of the cortex acts as a stimulus to

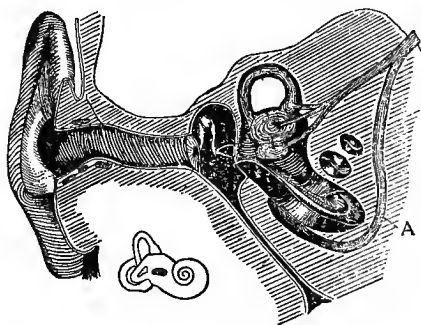


DIAGRAM SHOWING STRUCTURE OF THE EAR

In the lower figure the inner ear is shown natural size. In the upper figure the external ear is shown much too small relatively to the size of the internal structures. The oblique shading represents bone. A, nerve.

the mind, and the mind responds with the *sensation of sound*.

The Sensation of Sound. — Sound has intensity and pitch as well as qualities that depend on the combinations of wave systems. Pitch corresponds to color in light. But while there is but one "octave" of light, the ear can distinguish some ten or twelve of sound. So, while the spectrum (since the two ends are nearly alike) may be said to form a *circle*, the octaves of sound might be represented by a *spiral*, each ring of the spiral representing an octave.

A tone differs from a noise in that the sound waves for a tone are regular, while those for a noise are irregular.

A full, rich tone is one composed of a fundamental with many overtones, *i.e.* with weaker thirds, fifths, and octaves above. This corresponds somewhat to soft colors as opposed to "raw" colors, which means pure colors.

THE SENSE OF TOUCH

The organs for this sense are the nerve endings all over the surface of the body. The motor zone (which extends along the fissure of Rolando, that is, about from ear to ear over the top of the head), and the region bordering the motor zone is probably the region for both the touch sense and the motor sense. While the skin and mucous membrane everywhere are furnished with tactile nerve endings, the finger tips are our chief tactile knowledge gatherers. The tactile sensation is that of contact, and its chief qualities are expressed by the adjectives rough, smooth, hard, and soft.

THE MUSCULAR OR MOTOR SENSE

By the pressure on the nerve ending when the muscles contract, we measure the strain on muscles and tendons and the amount of muscular work. Through this sense we know the amount of muscular energy we put forth, and perceive weight and space. The pure sensation may perhaps be called one of strain, tension, or motion.

THE SENSE OF SMELL

The end-organs in the mucous membrane of the nose are sensitive to certain gases. The cortex centers are probably the median lower parts of the temporal lobes. The sensations are known as odors.

THE SENSE OF TASTE

The nerve endings in the papillæ of the tongue are sensitive to certain liquids. The brain center is probably in the neighborhood of that for smell. Sensations are known as flavors.

THE TEMPERATURE SENSE

It is quite well established that we have a distinct set of nerve endings sensitive to temperature. The sensations are of heat and of cold. The cortical center is not definitely localized.

THE ORGANIC SENSES

According to the evolutionary theory, all our senses were once organic, and fundamentally so they still remain. That is, they report to the brain *the condition* of the respective *organs* in which their nerve

endings are located. But, as we shall see under Perception, the mind has in the case of the special sense come to disregard the condition of the organ entirely, and has fixed its attention on the stimulus, to gain information about the external world. Sight no longer gives us any information about the condition of the retina, but we project the sensation out into space. Even in smell, which, like the other minor special senses, is less separated from organic sensations, we refer odors not to the mucous membrane of the nose, but to the "circumambient" air.

Organic Sensations. — *Organic sensations* give us information about the condition of the organs of the body. We feel pain whenever a nerve is injured, and the quality of the sensation differs with the nature of the injury. A burn smarts differently from a knife wound. Hunger indicates an aching void in the digestive organs; thirst, a lack of water not only in the digestive organs, but probably also in the blood and lymphatic fluids. Dizziness and seasickness are supposed to be caused by the disturbance of the fluids of the semicircular canals in the inner ear; the "close air," choking, and yawning sensations, from lack of oxygen in the lungs; and the feeling of exhaustion, from a scarcity of energy in the system. The cortical center for organic sensations is supposed to be the region immediately posterior to the fissure of Rolando.

WEBER'S LAW

It has been found that the increase necessary in the stimulus to produce a just perceptible increase in the intensity of the sensation is a tolerably constant

percentage of the previous stimulus. This percentage differs for each sense. Thus, if a weight of twenty ounces is placed on the hand, the amount necessary to make one feel any increase is one ounce. But if forty ounces are on the hand, two ounces must be added to make the increase noticeable.

The intellectual and feeling element of the reaction complement each other reciprocally. The less pleasure or pain there is, the more discrimination. This comes from the fact that when pleasure or pain engrosses attention, there is no attention left for observing the distinguishing qualities of the reaction. Thus the sensations, when moderate, of the four major special senses are practically void of pleasure and pain, and these sensations are the richest as material for knowledge, and capable of very great discrimination. The minor special senses are rich in feeling but poor in intellectual discrimination. Moderate temperatures occasion no pain and are readily distinguished, but an iron bar cold enough to blister the skin cannot be distinguished, by the sensation caused, from one that is red hot. It should also be noted that the use of an abnormally strong stimulus will be followed by a rapidly and constantly decreasing sensation.

This makes apparent the folly of employing habitually strong stimuli. The consumer of highly seasoned food is actually capable of less delicate taste discriminations than he who is sparing in the use of condiments. The teacher and preacher who shout habitually have themselves to blame that they do not command attention. Even corporal punishment becomes ineffectual when inflicted too frequently. To the

normal vision, forest and field are a restful green, and only the comparatively rare flower is of vivid hue. Just think if this were reversed; if the prairie were bright scarlet with here and there a drab gray or green flower! A speaker who tries to keep his audience sobbing or laughing all the time soon becomes tiresome.

THE SPATIAL ELEMENT

The spatial element, extensiveness, is found in some sensation if not in all (William James says it is found in all sensation), and this is the source of our perception of space. The motor sense possesses this element more clearly and more convincingly than any other, and so this sense gives us the basis of our perception of space.

THE PEDAGOGY OF SENSATION

The pedagogy of sensation and the senses is fundamentally a chapter in physiological hygiene.

It is the teacher's duty to discover and estimate, and if possible to relieve, any physical abnormalities of sense organs, such as nearsightedness, deafness, and color blindness; and to see that the necessary physical conditions are supplied: fresh air without which all cerebral activity flags, sufficient light from the right direction, and the absence of disturbing noises.

The sense organs themselves are susceptible of training. In fact, education consists largely in training the senses to act intelligently. Further discussion of the pedagogy of the senses is given in Part II.

ANALYSIS OF THE SENSATIONS

Summary

NAME OF SENSE	THE PHYSICAL STIMULUS	REACTIONS OF THE NERVOUS SYSTEM WHICH STIMULATE THE MIND	REACTIONS OF THE MIND
Sight.	The eye, i.e. the rods and cones of retina affected by vibrations transverse to axis of radiation from about 400,000,000,000,000 to 800,000,000,000,000 per second.	Nerve currents to occipital lobes.	Sensations of light.
Hearing.	End-organs of nerves in inner ear affected by vibrations longitudinal to axis of radiation, from 16 to 40,000 per second.	Nerve currents to temporal lobes.	Sensations of sound.
Touch.	End-organs in skin and mucous membrane, especially in fingers, brought in contact with a solid or with what acts as a solid.	Nerve currents to motor zone and neighborhood.	Sensations of contact, touch.

Motor sense.	Pressure of contracted muscles on nerves.	Nerve currents to motor zone and neighborhood.	Sensations of tension, strain, and motion.
Smell.	Olfactory cells in nasal cavity brought in contact with gas. (Probably chemical action.)	Nerve currents to median lower part of temporal lobes.	Sensations of odors.
Taste.	Taste buds in tongue brought in contact with a liquid. (Probably chemical action.)	Nerve currents to median lower part of temporal lobes.	Sensations of tastes, flavors.
The sense of temperature.	"Heat" vibrations, similar to "light" vibrations, probably affect end-organs in skin and mucous membrane.	Nerve currents to some portion of cortex of brain.	Sensation of heat or cold.
Organic senses.	Som disturbance of nerves in organs of body.	Nerve currents from affected parts probably to region of cortex posterior to fissure of Rolando.	A sensation of comfort or discomfort, usually but not always located in the organ affected.

Exercises

1. Give devices by which abnormalities such as those mentioned above may be detected and measured.

2. What can a teacher ordinarily do for pupils suffering with defects of this kind?

3. Organic sensations express the harmony or disharmony of any part of the bodily organism. *Example:* Hunger, nausea, vertigo, fatigue, dizziness, pain, feeling of well-being.

Give five other *examples* of such sensations, and name the part of the body affected.

4. A sense organ is a bodily organ so contrived as to pick up a stimulus of a certain class so that it will stimulate nerve currents in some afferent nerve. Describe the chief sense organs.

5. Describe the whole process of stimulus and reaction from the external stimulus to the sensation, for each sense.

MODEL. — Waves of ether pass through the cornea, aqueous humor, lens, and vitreous humor, and in passing are focused so as to throw an inverted image on the retina. Here the ether waves are "picked up" by the end-organs of the optic nerve. In other words, the waves excite the optic nerve, and its nervous energy reacts and sends pulse after pulse of nerve waves to the occipital lobes of the brain. When these pulses reach the brain, in some way the mind feels stimulated, and it responds by the peculiar sensation we know as light.

6. Which are the primary colors? Note that we seek for the psychologically primary colors, not for the physiologically primary.

7. What is the difference between noise and pure tone?

8. How can you tell that what your neighbor calls red is not perhaps what you call blue?

9. Suppose a person cannot distinguish red and green, how does a field of strawberries appear to him all red, all green, or neither?

10. Suppose the optic nerve were by an operation made to discharge its currents into the hearing center of the brain, what sensations would a glance at the moon give?

11. Give non-psychological *illustrations* of the relation of stimulus and sensation and of cause and effect. The following are suggestions:—

What is the logical relation between the jumping jack's motion and motion of strings? between the movement of a watch and the force employed in winding it? between the digging of a hole in a dam and the consequent devastating flood which occurs when the waters by means of the hole wear out the dam and escape.

12. Give *examples* of sensations and their stimuli.

MODEL. — A nerve is severed. This starts a violent current in the remaining portion of the nerve. This travels by way of the spinal cord up to the cerebrum, and sets up some kind of molecular disturbance there. This disturbance acts as a stimulus to the mind and it reacts, or responds, by the sensation of pain.

CHAPTER III

PERCEPTION

It seems strange that concerning the very activity that lies closest to us, we know least. The answer to the question, How do we think? how do we learn? is, as George Eliot remarks in "The Mill on the Floss," almost invariably a metaphor. The mind is thought of as a *field* to be cultivated; as a *storehouse* to be filled with useful knowledge; as *muscles* and *sinews* to be strengthened by mental exercise, the "splendid mental gymnastics of the classics," for example; and finally, often as a *stomach* which is to digest and assimilate knowledge.

All of which is very well; in fact, inevitable. Things that are not seen must be spoken of in figures of things that are seen. But what is not well, is that we take for granted that all that may be said of the figure is true of the thing shadowed forth by the figure. For it is not true that the mind acts or is acted upon in *all* respects like a field, a storehouse, a muscular system, or a stomach.

In studying *perception*, which is the basis of all acquirement of knowledge, we must look at the activity itself stripped of all metaphor. We can best obtain a clear idea of what perception is by studying in detail a concrete example.

AN ANALYSIS OF PERCEPTION

Miss Utterly beholds on Easter morning her "dearest friend's" new bonnet. So does a baby of six months. Both have, in all probability, very similar sensations, for the sense organs of both are affected in very much the same way. But the baby and Miss Utterly have very different perceptions. The baby sees only a blooming confusion, which, if there is not yellow in it, is not likely to interest him much. To Miss Utterly, the hat is a very definite thing. At a glance she takes in color, texture, flowers, lace, plumes, and the various grades and qualities of each.

Our ordinary conception is that *percepts* walk into our field of consciousness through our eyes, full-fledged. We think of the percept as something given to the mind from the outside. We think of the mind as passive in perception, as simply receiving impressions. This view is entirely erroneous. The mind is active in perception. We make our own percepts. Let us watch the process of making a percept.

As the image of the hat falls on Miss Utterly's retina, she has a sensation of colors. These sensations, however, give her no image. They are simply the material out of which images may be made. But Miss Utterly has seen spring hats before. The memories of these hats are not dead, they simply slumber. A new sensation awakens in the mind memories of similar objects. These old memories coalesce with the new sensation, and the result is a new percept.

Oh, what a commotion there is among all the old millinery memories in Miss Utterly's mind! There

come trooping forward all recent and long-forgotten hats and bonnets, plumes, flowers, leaves, grasses, ribbons, laces, bows, plaited straw, and memories of all other things more or less like these.

They all throng upward to the "threshold of consciousness," but few if any pass this threshold as individuals. Before they pass into full consciousness, they melt together with the sensation from the new bonnet, and Miss Utterly has a clear, crisp, vivid, and detailed percept of the new bonnet and exclaims, "Oh, what a dear!"

Under ordinary circumstances, perception is more memory than it is sensation. Nine tenths of what we think we see, hear, and otherwise perceive *now*, we do not sense now at all; we simply recollect it from our past experience. As a rule, the present sensation is simply a hint which calls up from the nether depths of our being that which we perceive.

There are then two factors in every perception: the *present sensation* and the *element from past experience*. The mind takes up the material furnished it by the various sense organs, arranges it, and combines it with the products of previous sensory experience to form what we call a *percept*.

We must guard against thinking that sensations are taken in their raw, natural state and just united with the image from past experience. Far from it. The original reaction of the mind which we call sensation is no more like the percept into which it is worked up, than a pile of bricks and a carload of lime are like a brick house. Often the relation and resemblance is even more tenuous. The sensations are mere direc-

tions and limits to the mind and show how it is to build its percepts. Do not imagine that anything from the "external world" creeps into the mind in sensation. The sensation is a purely mental affair, and contains no foreign element. Likewise the percept is built purely from home-grown timbers. But how, then, do we gain any knowledge of that which is outside of our organism? Because the nature of the reaction, though purely mental and our own, differs with the nature of the stimulus. And the percept, though built by the mind entirely, according to its own laws, will more or less faithfully reflect the universe, since the mind is an expression of the universe, or, to use Professor James's expression, since, after all, the mind and the universe developed together, and hence are something of a fit.

THE ELEMENT FROM PAST EXPERIENCE, APPERCEPTION

The process of combining the new sensation with past experience is often called *apperception*. It is this apperceptive process which gives form and meaning to the unshaped material received by the senses. This store of past experiences which comes out to meet and absorb, as it were, the new experience has been called by Herbart the "*apperceiving mass*."

The importance of the part played by past experience in the formation of a percept varies according to the person's age and consequent experience.

In the case of a grown person it often forms the greater part of the percept. I see a person coming towards me a long distance away. As he comes nearer, my percept of him becomes larger and clearer, and suddenly I recognize him as my friend Mr. Brown. The instant

I recognize him, my percept undergoes a wonderful change. At once it becomes much more definite and clear and its "Brownishness" fairly sticks out all over it. What has happened? Simply this, the instant I decided it was Mr. Brown, out came the mental pictures I had of him, and these all coalesced with the sensations, and made a very much improved percept. This conclusion is very much strengthened by the fact that if I was mistaken in my surmise that this person was Mr. Brown, the instant I discover this, all "Brownishness" drops out of the percept, and I am surprised that I ever could have mistaken this person for Mr. Brown.

The figure here used of two images, one the image from sensations, and one an image from past experience, coalescing into one, represents the main facts so far brought out fairly well. But there is a very important side of this affair which is not brought out at all. To appreciate this, let us take another example:

In the days of my youth in the woods of eastern Minnesota I used to hunt with an old blunderbuss of an army musket. Entirely innocent of the hunter's ethical code which forbids his shooting a bird not on the wing, I would steal down to the shore of the lake, and when I saw the head of a swimming duck, blaze away with a charge of buckshot. Once I saw the head and neck of a splendid fellow in the reeds, and I stole softly nearer until I could see the glitter of his eyes and the metallic sheen of feathers on the back of the neck. I shot, and lo! nothing happened! The duck did not fly, but underwent a strange transformation. There was nothing there but a crooked stick. .

I had really fired at the ghost of a duck brought up from the cold storage of my memory. Here the active formulating element came from my past experience, and the passive material from the present crooked-stick sensations. The active element, the "apperceiving mass," becomes the *tool*, the sensation becomes the *raw material*, or we may say the "apperceiving mass" furnishes the matrix, the casting form, and the sensation the molten metal that is run into the form.

A fisherman's tale which has unnumbered variations runs as follows: A fisher had a minnow on the hook, which was swallowed by a perch, but before he could get the perch out of the water, it acted as bait and was swallowed by a bass, and just as he had the bass at the surface, the bass was swallowed by a fifty-pound muscallonge. Each fish except the last had been caught on a bait, and then in turn became the bait of a larger fish. Now this story of the fisherman may be doubted, but it is in just this way that knowledge, when acquired, becomes a bait by means of which we acquire more knowledge. Every idea, as soon as fashioned, becomes a tool for fashioning more ideas.

THE SENSATIONS AS FACTORS IN PERCEPTION

Tactile and Motor Perception. — Sensations to form percepts must be arranged into combinations having space relations. Our primary and fundamental perception of space comes to us in the motor sense. With this the tactile sense is very intimately united.

In moving our hands and feet, we have sensations of strain, motion, of spending energy. This the mind interprets as *space*. Space, then, is psychologically

that in which one can move, and the amount of energy spent in moving is the measure of the space moved in.

Form, or *extension*, of an object is thus the space relations of that object's parts to one another. This is primarily perceived by tactile and motor perception.

Weight is perceived by the motor sense, by so interpreting the sensation of tension or pressure. It is called in this connection the *baric sense* by Dr. Montessori and others.

We perceive our own motor effort by so interpreting the strain on the muscles. For muscular efforts involving practically the whole system, as in pushing or pulling, we estimate the effort from the strain on the diaphragm only. Hence, one can easily get the "feeling" (percept) of pulling or pushing by taking the proper bodily attitude and contracting the diaphragm.

Strictly speaking, the only *tactile* percepts are percepts of surface conditions, such as rough, smooth, sticky, hard, soft, and plastic, and even in these there is a motor element.

The tactile and motor senses may be called our *primary senses*, as they furnish the fundamental elements of our perceptual world. They give life, immediateness, and the sense of reality to our percepts. When Thomas was in doubt as to the reality of his Lord's resurrection, he said he could not believe until he had touched the wounds of the Lord with his own hands. And John puts as a climax above what they had heard and seen, "which — our hands have handled."

Visual Perception. — Since the retinal image has two dimensions, doubtless purely visual sensations

have elements of extension; but these are very weak and uncertain until reënforced. Let us experiment.

Estimate the length of the blackboard. Twelve feet. Very well. Now, you will notice that in estimating distance right and left and up and down, your eyes move up and down or right and left as the case may be, over the distance to be measured. This gives you a muscular sensation from the strain on the muscles that move the eye, and this sensation is used as a yardstick to measure the distance.

But for the "third dimension" (distance away from the eye) there is no direct element in visual sensations. The third dimension must be interpreted into visual perception from various indirect indications in visual sensations and from motor sensations. Let us examine a case.

I see a horse and carriage the other side of the river. I see them half a mile away, and I see that there is a large black horse and a four-wheeled carriage. Now the physical stimulus consists of two flat images on the retina of my eyes. Why do I interpret these two somewhat different "flat" sensations as a solid percept half a mile away in the third dimension? Well, I get the third dimension by interpreting the image in terms of a third dimension horse and carriage which I have examined previously at close range. Then I see the river between me and these objects, and its width fills a certain visual angle which I have learned to know is half a mile.

I look at the class before me. I have a very definite perspective of the class, and see plainly that Smith sits about three feet behind Jones. If, however, I

cover one eye, my perspective becomes very much poorer. Why? When I look with both eyes I must make the axes of both eyes meet on the object I am looking at. I must pull the axes of the eyes much farther from the parallel, and much closer together when viewing an object near me than one far away. This causes a strain on the muscles of the eyes located between the eyes and the nose. This strain occasions a muscular (or motor) sensation, and the stronger this sensation is, the nearer I judge and the nearer I see the object. This sensation is so slight, that usually it is only subconscious in its original form, but it is of great use in helping us to discover the "third dimension."

Besides the means of getting the third dimension by binocular vision and by the apparent and real size, we get in vision our perception of third dimension from the muscular sensation of the strain of the ciliary muscle of the lens in focusing, from the indefiniteness or dimness of distant objects, and from the number and positions of intervening objects. Notice how very unlike *distance* the sensory data for distance are.

All this perception of extension (space) through the sense of sight is, however, secondary. But by fitting our visual sensations into the space scheme of the motor sense, we get a visual world clear, distinct, and *external to the eye*. The space which we see is literally *hand-made*.

Auditory Perception. — As the motor sense, touch, and sight may be called the space senses or the senses of extension, so the motor sense and hearing may be called the *time senses* or the *senses of succession*. Duration, succession, rhythm, periodicity, are attributes of motion, hence here too the primary time sense is the

motor sense. But just as we usually translate into visual terms the space we first perceived by the motor sense, so we translate motor time into auditory time. Thus, while the visual world is a world of outside-of-one-anotherness, the auditory world is a world of after-one-anotherness.

Direction and *distance* are the only space relations of hearing, and these are very imperfectly perceived. Direction is determined by the relative loudness of the sound in the two ears. Hence persons having hearing in only one ear cannot tell the direction of sound. Distance is arrived at only secondarily by so interpreting the intensity and clearness of the sensation.

Olfactory and Gustatory Perception. — Our olfactory and gustatory senses give us practically no space relations. Odors are often mistaken for flavors. More than half of the joy of coffee is its odor. What we think its taste is mostly the aroma entering the nose through the "back door." Hence, when the nose is closed by a cold, coffee becomes flat and insipid. The "taste" of pepper is rather a pain from inflamed nerves than true flavor.

Perception by the Temperature Sense. — Temperature, naturally, is the primary perception by this sense. There are some interesting secondary perceptions. As a wet surface by evaporation usually is cooler than its surroundings, we usually perceive dampness or wetness in fabrics and of objects by this sense. Metals are good conductors of heat, and hence when temperature is below blood heat metals feel cooler than poorer heat conductors. Thus we often perceive metals by the temperature sense.

Organic Perception.—The organic sensations are perceived usually as pain or well-being in the organs affected. Sometimes, though, the feeling is not perceived at the true place of stimulus. Thus deranged digestion is often felt as headache, and a jar of the “funny bone” at the elbow is perceived as a whirring pain in the little finger.

Thus, then, are sensations synthesized and interpreted to form percepts.

THE TRAINING OF PERCEPTION

The time for training perception is childhood. Perception should be trained to be accurate, swift, and acute. There is need of introducing special exercises to train the senses, but these exercises should not be detached or artificial, and should connect naturally with the use of the senses in daily tasks.

There is affecting our senses what may be called the disease of civilization. Civilized man does not “have to” use his senses. Road overseers see that the road is safe; we expect plain and patent warning wherever there is any danger; we expect the vendor to make it impossible for us to fail to notice his wares; in school, our portion of science and arts comes to us cut up into edible lengths, and labeled with name and directions; our work is almost always a routine, in which we continually go in a beaten path; and guidebooks, signboards, guards, advertisements, newspapers, and teachers make observation unnecessary. As a result civilized man is blind and deaf and insensible to nine tenths of his environment.

Education ought to do something to remedy this defect in modern life. First, if we would remedy this

defect, it is imperative that we have a direct, cold-blooded determination to know this universe at first hand. To this end, in the hands of a wise teacher, almost every subject may contribute; but the subjects particularly rich in opportunities of this kind are the natural sciences and manual training.

A detailed discussion of the training of the senses and the perceptive faculties will be found in Part II.

Exercises

1. In what respects are the following figures inapplicable?

Studying mathematics is mental gymnastics.

He had not digested the book thoroughly.

He has a well-cultivated mind.

2. A sailor tried to give a friend an idea of Liverpool, and the main thing he could say was that in Liverpool he had had the best ale and the poorest lodging in his life. What was the matter with his apperceiving mass?

3. When a child for the first time in his life looks at letters, how does the percept he gets differ from that of his teacher?

4. Why, in the case above, do the teacher's and the pupil's percepts differ?

5. How do we get the direction from which a sound comes by auditory perception?

6. We locate flavors in the mouth, but we do not locate sight percepts in the eye, but in space outside the body. Where do we locate odors?

7. A violinist in a diminuendo passage moves the bow a couple of times over the strings without touching them. Still the audience hears a faint sound. Why?

8. How do we perceive distance up and down and right and left by visual perception?

9. Why can you read English in a poorer light than any other language?

10. Explain some illusion in your personal experience.

CHAPTER IV

IMAGINATION

EVEN without the nerve stimulus and the sensation, we are still able to construct images from our past experiences. This power is imagination.

IMAGINATION AND PERCEPTION

Imagination depends on perception for its material. Every element in imagination must first have been found in perception. A color-blind person blind to red cannot imagine red. A person deaf from birth cannot imagine sound.

The chief difference between imagination and perception lies in the fact that in perception the stimulus is present to the senses, while in imagination there is no external stimulus, and it is therefore as a rule less vivid. However, the two processes are sometimes so nearly equal in vividness, that we mistake imagination for actual sensory experience. Especially is this true of our dreams, which, though wholly the creation of imagination, seem to be reality.

Perception is also dependent on imagination. When we read in a familiar language, we never take the trouble to see all the letters; we just catch a few characteristic points in the shape of a word, and then supply the rest by imagination from memory.

KINDS OF IMAGINATION

Sense Classes of Imagination. — Thus there are as many kinds of imagination as there are kinds of perception, and of the same types, as visual imagination, auditory imagination, etc.

For example, if a certain song is mentioned, one may have a mental picture of the printed score, or one may imagine hearing some one sing it. Again, one may feel certain vibrations in the throat like those felt in singing, or one may feel the touch of the piano keys as one thinks of playing the song.

Reproductive and Productive. — Some psychologists classify imagination as reproductive or productive. In the first form of imagination, the mind merely represents an image exactly as it formerly appeared in consciousness. In the second, the mind creates a new image by combining elements from many images.

To illustrate, if I close my eyes and see the image of the house I used to live in, I am using reproductive imagination. But if I picture to myself the house I should like to build, combining the attractive features of the various houses I have seen, I am employing productive imagination.

PRACTICAL VALUE OF IMAGINATION

Imagination is needful in every mental effort. Many people think that imagination is only for the actor, the artist, and the poet with his "eye in a fine frenzy rolling," but this is wrong. The scientist, mathematician, engineer, and soldier are just as necessarily and just as fully men of imagination. A part of Napo-

leon's genius consisted in his ability to imagine so perfectly and so vividly the complex movements of troops from one place to another in battle. In solving "mentally" a problem like this: If $\frac{2}{3}$ of a pound of tea costs $\frac{3}{4}$ of a dollar, what will one pound cost? we must imagine $\frac{2}{3}$, $\frac{3}{4}$, pound, and dollar, and keep them without confounding the images. Imagination is not necessarily something wild, fanciful, and irresponsible. It may be as sober, grim, and exact as the iron law of necessity.

THE TRAINING OF THE IMAGINATION

Training for Accuracy.—Imagination should be trained to be (a) exact, clear, and definite, and (b) rich, colored, varied, and full of detail. Mathematics is perhaps the best discipline for clearness, exactness, and definiteness, as in mathematics we shall be left floundering helplessly unless we keep our symbols apart and definite, and unless our thought images are clear. This involves also the faculty of being able to handle a great number of images at once without confusing or losing them. Chess, cards, and many other games are an excellent drill for this purpose, for there also success depends on not confusing images. Sloyd also contributes to this discipline, for in sloyd the article produced will inevitably reveal any inexactness in the image in the mind of the workman. The same is true of drawing. These forms of discipline also enrich the imagination by adding more detail.

Since exactness and clearness are the great desideratum in these studies, the teacher must insist upon having them. An exact mathematical language, both

oral and written (in statements), should be required at all times. Insist on perfect work in handicraft, and thus secure exact and clear imagination.

Training for Enrichment. — For enriching the imagination with color, detail, life, and variety the most important school subjects are literature and history. It is a pity, though, that the school and textbook way of treating these subjects is so "outliny." In fact, teachers and text often seem to avoid the human, broad, interesting side of these subjects as not dignified or "scientific" enough for the schoolroom; and present everything in a solemn drab dullness. Remember that detail, color, action, and human interest give life to learning and enrich the imagination.

We are economical in the expenditure of mental energy; in other words, we are all mentally lazy. We were born that way. As a result, whenever we can, we are prone to use the merest skeleton of an image that will serve the purpose. In reading of Robinson Crusoe's landing on the desert island, we "see" in our imagination the mere outline of a man in water. We ought to see the wide sandy beach, with the vast green billows curling over and breaking into white foam; notice the color and texture of the clothing of Crusoe; see the shrubbery and trees on the shore and notice the tall gaunt trunks of the palms, with their giant brush of dark green foliage. We ought to hear the southing and roar of the wind and the pounding and rolling of the waves on the beach. We ought to get the motor "feel" in our limbs of the man struggling with the breakers, and the annihilating sensation of the salt billows engulfing him. Read with

such imagination, we have an exciting tale indeed, and we have all the liberal education of a shipwreck without wetting our feet.

THE ABUSE OF THE IMAGINATION

Daydreaming as Recreation. — How far is it allowable to use one's imagination just for pleasure? Of course, it goes without saying that all imagination on morbid, ethically forbidden, or immoral topics is harmful. Morally and even physically, the essence of a deed is its idea, and so he who imagines an action has "committed it in his heart."

But what of perfectly innocent but perfectly useless building of air castles, reading of novels and poetry? I think a certain homeopathic amount of such reading may be defended as recreation. This would apply especially to persons employed in dry, routine occupations, as, for example, bookkeepers, or those whose labor is manual. They may well relieve the monotony of their existence by building castles in Spain, or reading light literature for the mere pleasure of using an unrestrained imagination. Why should not the hard-working kitchen maid forget for a brief hour the drudgery of her life and live the life of a countess with the heroine of the society novel? Would it not be cruelty to snatch the sentimental story from her hands, and put in them instead an analytical tale by Henry James, and tell her to read it carefully and improve her mind?

For the student and teacher, and others in pursuits full of intellectual interest, there is less occasion for the mere sweetness of imagination; but even here I

think we can scarcely with safety make the rule, often insisted on by the mentors of the young, that they must never "skim over" a book, but that the only proper way to read a book is to study it thoroughly. I think it is safe to say that a novel should not always be as thoroughly digested as a scientific treatise and that daydreaming is not always harmful.

But let it be understood that dissipation of the imagination is frightfully common; and that the temptation thus to dissipate is very great, since the wine of imagination is always on tap. - Recreation should occupy only a small portion of our time. Few practices are more destructive than professional pleasure hunting. And the person who spends a portion of his working time in ever so innocent daydreaming or in reading light literature merely for pleasure, is as truly a voluptuary as he who debauches in grosser ways. He does not travel towards perdition as fast as the drunkard, but he is headed that way.

Newspaper Reading. — Here may be the place to say a word about newspaper reading. Probably no industrial waste in this country is greater than the time spent in useless newspaper reading. A good deal of the news is not fit to read; we should be better off without knowing it. Much of the contents of a daily is perfectly valueless to the average man, and most of what is worth while is much diluted. Every person who values his time — and every one should value his time — should learn the art of skimming the cream off a daily in a few minutes. One great trouble is that the daily in its struggle to "scoop" tries to be fifteen minutes ahead of truth, and hence contains much that

is untrue. The busy man will do well to get his serious history of current events from a weekly or monthly periodical.

Need of Reading more Serious Literature. — We read too much fiction. There is no better literature than the best fiction; but there can be too much of a good thing, and there is too much of the good thing called fiction. Let us enrich our imagination with fiction, but not exclusively with fiction, as the records of our libraries seem to prove is now the well-nigh universal practice. We ought to read at least as much history as fiction. After all, the characters that God actually has permitted to exist, have as strong a claim on our attention as those which some novelist has created. We ought to read at least as much science as we read fiction. And lastly, we ought to read at least as much serious fiction as that which aims simply to amuse.

CHAPTER V

MEMORY

THE PHYSICAL BASIS OF MEMORY

MEMORY is a habit, and in its usual meaning nothing but a habit. When we say we remember how to spell a word we mean simply that when the image of the word is before the mind and when we start to write it the hand has the habit of writing just the right succession of letters. There must be some sort of "groove" or "rail" in the brain, built up by previous repetitions of the act, over which the nervous impulses travel in such a way as to make the hand go through the necessary motions to form the word. To remember the multiplication table, means to have a certain set of habits in the nerve centers for the organs of speech, which makes these organs repeat the multiplication table aright. If we know the multiplication table so well that we do not need to repeat a table from the beginning even silently or in imagination in order to find out any product in that table, this means that the visual or auditory centers of the brain have the habit of innervating in the proper way for picturing the required portion of the table whenever it is necessary, or that the motor center for speech acts automatically. Map knowledge in geography, names and dates in history, are memorized in the same way. We get into

the habit of thinking "1492" as soon as we have thought "Columbus discovered America."

Hence physiologically, psychologically, and pedagogically, habit, skill, and memory are one and the same in almost all aspects.

The student is warned, however, from holding the doctrine of the physical basis of memory in its bald materialistic form. We must not imagine that the cortex of the brain is simply a *tabula inscripta* upon which neural currents have recorded the experience of the past.

Since the cortex of the brain changes every few weeks, it takes an athletic imagination to believe that every atom in the new set of matter should occupy exactly the position of a corresponding set, *unless there is some syntactic force* that places the atoms according to a certain plan, which this rebuilding force possesses. Lesions have occurred in the cortex of the brain and entailed loss of corresponding functions and memory. But sometimes the lesions have grown in again and healed, and the patient has recovered. Evidently the "paths" and "channels" have been reproduced in the new matter just as they were in the old, though for a time there had simply been a hole there.

ANALYSIS OF MEMORY

Every complete act of memory involves *reproduction* and *recognition*. The act of reproduction is nothing more than reproductive imagination, which is the simplest form of imagination, just reproducing former percepts in their original form.

But this is not a complete act of memory. In fact,

the essential element of memory is lacking. I am conscious of having a wart on my finger to-day, I was conscious of it yesterday, and I will be to-morrow, but if to-morrow I do not recognize my present percept of a wart as being in any way related to my former percepts, I cannot say that I remember anything. To be complete memory, there must be a recognition that the present image or percept is a copy of a former image or percept. This involves a great mystery. How can we compare the present image with a mental state that is past and gone? It will not do to say that we have the record in the brain to go by, because all that the "paths" in the brain can do is to furnish the conditions for the revival of the former image. But when "revived," it will be a new *present* image, of course, with no odor clinging to it of a grave from which it was resurrected. To me, this power of the mind to compare its present state with a past state, proves that time is in the mind and not the mind in time. It proves that both the past and present are included by the mind. For that matter, if the mind existed in the present only, how could we ever get so much as an inkling that there is such a thing as a past?

SENSE CLASSES OF MEMORY

Just as in the case of perception and imagination, so memory may be said to be of as many classes as there are senses. The three most important classes are *visual*, *motor*, and *auditory*; next, but far less important, is *tactile* memory, and again far below tactile, we find *gustatory*, *olfactory*, and *temperature* memories.

Visual Memory. — Visual memory is probably in

most persons of greatest importance. The art of reading tends to increase the visual sphere at the expense of the auditory. This subject will be discussed more fully in Part II.

Motor Memory. — Motor memory is more prominent in our lives than we usually recognize. Languages that we speak, we remember by motor memory of the vocal organs. When we have a thought to express, just the right movements of the vocal organs to express that thought occur to us. So, physiologically, a spoken language resides in a portion of the motor zone of the brain. A language we read is of course remembered by visual memory, more or less in connection with auditory memory. In the case of a language we have first learned from books we probably, most of us, translate immediately the auditory image into a visual image before we have a complete percept of it. For, usually, languages first learned from books never penetrate very far into auditory memory. To most college students an oral Latin sentence is unintelligible and to be understood must be reduced to writing. If an oral Latin sentence is understood, the mind usually translates the auditory images into the visual memories of printed words.

Tactile Memory. — Memories connected with the sense of touch have a wonderful way of attaching themselves to visual percepts. Things *look* hard or soft, *appear* rough or velvety, we say; which means that our experience tells us that objects of a certain visual appearance have these qualities. When the visual image appears in the mind, the tactile memory revives, and we have the tactile experiences connected in

imagination and perception with the visual. Now those tactile memories attach themselves directly to the visual percepts and seem to be a part of them.

Gustatory and Olfactory Experiences. — Flavors and odors can scarcely be imagined at all by the ordinary tongue and nose. Try to imagine as common a taste as salt and contrast it with, say, quinine. Or compare in imagination the odor of a rose with that of a violet. To most persons the result will be vague. But though it is difficult to recall flavors and odors in imagination, it is easy to recognize them when they recur, which, of course, is as truly memory as the first case.

Odor memories attach themselves readily to memories of emotions. In fact, odors are the cues for the recollection of emotions. When a child of five years I lived for a summer in Minneapolis, then a lumber mill town. Every time now that I get the odor of pine lumber, I am back again in the emotional atmosphere of childhood, and I remember just how it felt to clamber down the steep banks of the Mississippi.

THE TWO KINDS OF MEMORY

Memory may be divided into two classes, mechanical and logical.

Logical Memory. — All our past experience is found in our subconsciousness, — but not in a confused unrelated mass, but more or less connected by bonds of association. These bonds are stronger, more systematic, and more frequent in the well developed, well educated mind than in the uneducated. The problem in memory is how to get the idea from the subconscious

“part” of the mind into consciousness. This can only be done by starting from something in consciousness at the present moment and following the association strands as they lead down into the subconscious, until if possible the desired idea is reached. Logical memory is a process of integration. The mind reconstructs the logical whole of which both the idea present in the mind and the desired idea to be remembered form parts. All we have to do is to bring up the whole unity from the subconscious, and then necessarily the desired idea will also come up. In the vast vault of the subconscious, ideas are grouped and connected according to their logical affinity: cause and effect, whole and parts, purpose, means and result, similarity and dissimilarity. When the desired idea is fished up by means of a logical line of relations, we have logical memory.

The way to memorize logically is then plain. Form firm and clear logical unities. Dwell upon relations, not alone upon facts. Discriminate in your choice of relations; choose those which make useful and natural logical unities. The Council of Worms may of course be associated with worms in zoölogy, because of the similarity of sound or rather of letters, but it is unwise to establish such a unity in the mind, as we are not likely to desire to think of worms when the “Council of Worms” is before the mind. Clarity and distinctness of conception are vital necessities to good logical memory.

In studying any subject where there is a field for logical memory, try to understand the subject as thoroughly as possible. That is, seek out as many of its

relations and ramifications as possible, and determine the logical rank and value of each. Put the subject in its true perspective so that the small may appear small, and the important truly great. Leave no dark corner unexplored and leave no misty borderland. At times you must finally leave an idea under the category: "I don't know," but then be sure just where your knowledge stops and your ignorance begins. Always look for the unifying idea. No logical study is ripe until it has discovered the great mother thought that unifies, illuminates, and informs the whole region. It is safe to say that under normal circumstances nothing that has been thoroughly learned by the logical method can ever be forgotten.

Mechanical Memory. — Some things must be memorized, however, whose logical relations are so weak or recondite that they are of no practical value for memory, or which are entirely without such relations. Why should the names of our foremost national heroes be Washington and Lincoln? There is no logical strand that leads to those names rather than to Smith or Jones. Again, that $7 \times 7 = 49$ may be verified "logically" on the fingers, but this process is so slow, that it is well to know the multiplication table mechanically as an arbitrary set of facts.

Mechanical memory depends on mechanical association, and seems to be most perfectly explained by the hypothetical grooves, or "paths" in the gray matter of the cortex of the brain. Let us anticipate the law of mechanical association: If two ideas have been together in the mind, either simultaneously or in succession, the recurrence of one of these ideas will

tend to recall the other. The strength of this association varies in direct proportion to the time the two ideas have been together in the mind in clear consciousness and in inverse proportion to the time that has elapsed since they were so together.

There is therefore one method and one method only for mechanical memorizing : *Repeat*. Practice, review, drill, are other names for the same process. This is not simply the most important, it is absolutely the *only* exercise, method, or device that will in the least further mechanical memorizing. Clear understanding of the subject does not contribute to mechanical memory. Nonsense rhymes are as easily memorized as poetry, as far as the mere mechanical part is concerned. Thoughtless, "parrot" repetition of the multiplication table, provided it is accurate, is as efficacious as repetition with concentrated attention in fixing the table in memory.

THE PEDAGOGY OF MEMORY

The pedagogy of memory becomes, then, very simple. Whenever possible, use logical memory. That is, find some rational connection between the known and the unknown. Form some larger logical unit of which that to be remembered is an integral part. Find for every new acquisition of knowledge its appropriate, logical place in your intellectual store. Do this whenever possible, and reduce mechanical memory to its lowest terms, but don't fail to recognize that there is an irreducible surd in every branch of knowledge that refuses to be memorized logically. This must be memorized by drill, by plain, simple repetition.

Old-fashioned and Modern Methods of Teaching Compared. — One reason why so often the inspiring teacher of to-day, who makes the pupil think, is apt to “lack in thoroughness” is that he does not drill enough. He fails to fix the mechanical starting points and mile posts in the minds of his pupils. And often he attempts the impossibility of trying to get even this surd rationally. He will stop his drill to pursue some delightful logical chain of thought with his pupils. Now this exercise in thinking is surely more entertaining than mere mechanical memorizing, and in every way a higher kind of mental activity. But the mechanical element is absolutely necessary. Hence it is an injury to the pupil to allow him to neglect the only exercise that ever will give him this element in his education.

Our grandfathers spent all their time in the elementary schools in memorizing. Their teachers were all drill masters, and school was a treadmill of repetition. Very naturally, our grandfathers detested school, and considered it a necessary evil. Our fathers discovered that there is nobler work to be done in the schoolroom than memorizing. The pupil was invited and incited to *think*. Converts easily become fanatics. The teaching profession, discovering that it had neglected the greatest things in school life, became enthusiastic for reform. No more soul-killing drill now in the schoolroom! All was to be “development”! The pupil was always and everywhere asked, *did he understand?* never, *did he know?* The result is slightly ludicrous. We have classes in English history discussing the spirit of English liberty, who do not know whether Alfred was a Saxon or a Dane.

The product of the old school knew as a rule only a string of meaningless names and dates; the product of the new school knows not even that. A certain amount of memorizing is necessary, and to get it we must still maintain some of that old-fashioned drill our grandfathers practiced and our fathers ridiculed.

Exercises

1. Illustrate how the paths of discharge in the nervous system are supposed to condition memory.
2. In a history lesson, what would you memorize by logical and what by mechanical memory?
3. How would you memorize the logical element of a lesson?
4. How would you learn the multiplication table?
5. How would you learn to spell?
6. Give any devices you may know for making drill less tedious.
7. Recall the odor of coffee and contrast it with the odor of tea.
8. Give an example if you can of a case where an odor has recalled a past event in your life.

CHAPTER VI

CONCEPTION AND JUDGMENT

CONCEPTS, THEIR FORMATION AND APPLICATION

HITHERTO, we have dealt only with products of the mind which have the space form, images and percepts. We shall now study the higher form of the intellectual activity, thought proper, and its products. The unit of thought is *the concept*.

The concept is a unit of the *meaning* of things, which the mind handles as an integer and as having individual existence. It may be defined as a unity of attributes, or notions.

Abstraction. — Concepts are formed by abstraction. This consists in mentally separating a notion or attribute from some percept or image. Abstraction is no spatial affair even when dealing with space concepts. Thus when we abstract *red* from a red surface, we do something which cannot possibly be pictured. For we cannot imagine or perceive *red* without also imagining or perceiving a red surface. But we can *think* of a color without logical reference to surface.

But qualities, notions, are not only abstracted. They are also put together into new unities, which we call concepts. This process ought by rights to be called *concretion*.

Generalization. — After having formed a concept, we apply it ; that is, determine what objects contain the

concept, or "come under" it. This is generalization. The number of objects to which a concept applies forms its *extension*.

Sometimes it is given as an absolute rule that "*intension*, the number of attributes, varies inversely as extension." This is generally but not always true.

The general truth of the statement can be appreciated from the following:—

The concept *vertebrate* is very simple; it is only *an animal with a backbone*. Its intension is hence very small; but its extension is very great, as it includes all animals with backbone.

The concept *carnivora* has a greater intension than *vertebrate*, as it has all the attributes of *vertebrate* with *flesh eating* added. But of course, by the same token its extension is smaller since it contains only a part of vertebrate animals.

Concepts may also be classified as general, if they apply to all of a certain class; and particular, if they apply only to individuals.

Evolution of Concepts.—Now study the generation and evolution of concepts concretely. The baby learns to call a certain bearded man father. He forms the concept *man-with-whiskers* = *father*; and will at first call all bearded men father. In time he learns that the intension of the concept *his father* includes much more than whisker-man.

CLASS CONCEPTS AND PRACTICAL CONCEPTS

Some psychologists recognize no concept except class concepts. But the unit of thought most frequently used is not the class concept.

Thus in ordinary thinking we do not think of the cat as the domesticated small member of the feline family carnivora, class vertebrate. We think of it as a mouse catcher, a nuisance for shedding hair, a nice pet, or the one who is to have the milk, just as it happens. We may call this other class of concepts practical concepts.

We are all practical in forming our workaday concepts, and none more so than children. We are in the best sense pragmatists; a thing goes with us under the concept of its use. Ask a child, and he will tell you that a cup is "something to drink out of," a pen is "something to write with," a bed is "what we sleep on," and snow is "to make snowballs of and to coast on."

So rich in attributes or relations (as attributes also may be called) are the objects around us that we never use more than a small part of them in forming our concepts. And naturally, we pick out those relations which are of most interest to *us*. Thus an oak is so many hundred feet of lumber, to the lumberman; a tree of the *Quercus* family and with certain biological peculiarities, to the botanist; a source of tan-bark, to the tanner; a producer of acorns as food for hogs, to the hog-raising farmer; a splendid shade producer, to the picnic party; and an important element in the composition of a landscape picture, to the artist. Each has a concept of the oak, true and adequate for his present purpose, and still each has a different concept. A practical concept, then, may be said to form around a *center of interest*.

However, in the system of human knowledge known

as science, there is a concept of every object of thought, which we call the scientific or class concept. This is the essential meaning, the central meaning, of that thing, and may be considered the mother concept from which all other meanings can be derived.

Definitions. — Class concepts can very easily be tagged and identified, and this process is the scientific form of definition. A definition consists in giving the *next general class* (*genus proximum*) and the *specific difference* (*differentia specifica*). Example: —

A quadrilateral may be defined as a plane figure with four sides. Here *plane figure* is the next class and *four sides* is the specific difference. Again, a parallelogram may be defined as a quadrilateral with opposite sides parallel.

SYMBOL AND CONCEPT

No concept can be pictured, not even the concepts of space-occupying objects. For example, take the concept "dog." You cannot make a picture of it, for, pray, what size would you make it, and what color? It must at the same time fit a lapdog and a St. Bernard. It must be as long and low as a dachshund, as slender as a greyhound, and as stocky as a bulldog. So it is quite evident that no picture can be made of this concept. Harder still would it be to picture *beauty* or *truth*, or *reciprocity*.

Concept without Symbol Impossible. — But we cannot think of a concept without the use of some image. However general an assertion we make about dogs, we must have some "doggy" image to which to fasten our thoughts. "Pure thought" without any

space image is an impossibility. But the image is never the concept. It is a counter which *stands for* a meaning that always transcends it.

This representative image is naturally an *example of the class*, if the concept is such as to allow it. Thus the representative image in the case of the concept *dog* is an image of a dog, usually of some dog familiar to the thinker. But in many of the higher concepts this is not possible. Where the concept is an abstract quality, the symbol may be the image of a thing containing it. Thus *heat* may be represented by a flame, and *beauty* by a beautiful woman.

But often the relation between symbol and concept is much more tenuous, and sometimes entirely artificial. Thus when the banker thinks of profit and loss, he probably sees in his imagination simply those written words in a ledger.

Danger of mistaking Symbol for Concept. — Much vicious thinking consists in mistaking the symbol of the concept for the meaning for which the symbol stands. It is natural and perfectly right that we should allow the symbol to share in the glory and honor of its meaning, for only thus can we practically honor the meaning. Thus the Christian rightly honors the cross, and the patriot will not allow his country's flag to be treated disrespectfully. But as soon as we lose the sense of the derivative and reflected nature of the symbol's value, we are in grave danger. Much of the fanaticism of the world results from the mistaking of symbols for concepts.

"Bonehead" is a picturesque term of the diamond. There is a kind of ossification of the mind that is com-

mon both off and on the baseball field. This ossification is much facilitated by the unvarying use of the same symbol for the same concept. Thus, a convict's stripes stand for moral depravity, and a "stove pipe" hat for respectability, and many find it difficult to dissociate the symbol and its usual meaning even when they know that the actual facts are exactly the opposite.

Much narrowness of thought results from mistaking the symbol for the meaning. The simplest of symbols or representative images is noted when an individual is made to represent a class. Two patriots are discussing woman's suffrage. "I tell you," says A, "women have not sense enough to use the ballot. I know they haven't. Now my kitchen maid, this morning, mistook a sack of Portland cement for buckwheat flour, and actually had it on the griddle! And you would give the women the ballot!" His interlocutor, who is madly in love, can think of nobody but his lady love when he thinks of the fair sex, and he declares that if women had the ballot, corruption would vanish from politics before their pure presence as mist before the morning sun, that even the sin-seared political boss in the presence of such angelic beings would shrivel up like the guilty thing he is, and reform or hie himself to a hole to die in. Both are making an accidental individual stand as the synopsis as well as the symbol of the whole sex.

THE RIGHT KIND OF CONCEPTS

Concepts should be clear, definite, and rich. The store of concepts in the mind should be well organized; that is, classified and related. This is almost self-

evident. Loose and lazy thinking results in lazy ideas which imperceptibly melt into one another. Science has been defined as classified knowledge, and as the concept is the logical unit of knowledge, science consists in classified concepts.

THE LOGICAL CLASSES OF CONCEPTS

Concepts are often divided into substantive and attributive concepts, but the following seems to be a more consistent and complete division:—

- (a) Ideas of things, substantive concepts.
- (b) Ideas of events, motor concepts.
- (c) Ideas of qualities, attributive concepts.
- (d) Ideas of manner or circumstance, modal concepts.
- (e) Ideas of relation between two other concepts, relative concepts.

These classes correspond respectively to nouns and pronouns, verbs, adjectives, adverbs, and relation words, as prepositions and conjunctions.

It is to be noted that substantive concepts may be thought of independent of any other concept. Motor concepts are always thought of as united to some substantive concept. Thus we cannot have the idea *running* without that of *some one* running. Attributive and modal concepts are always dependent or secondary to some other concept. They are fractions of a larger unity. Thus *good* implies that some being is good, and *swiftly* that some motion happens swiftly. The relative concept, of course, implies *two* other concepts, since a relation is always between two ideas. This discussion shows that grammar is logic incarnate, and that logic is the soul of grammar.

JUDGMENT

How a Judgment is Formed.— Judgment is explicit conception, and the object of the judgment activity is to organize and relate our concepts and to produce new concepts by uniting old ones.

A judgment when put into words takes the form of a sentence and, as such, can be studied and analyzed without difficulty. The judgment, then, consists of subject and predicate. The subject concept is always a substantive concept. Hence the subject is always thought of as a space-occupying object, a thing, while the predicate is always thought of as a time-occupying energy, an event. Thus, in the judgment, "Birds fly," *birds* is the subject, a space-occupying object, and *fly* is the predicate, a time-occupying event. But mere existence, a state of being, has duration and is an event. Thus in "The mountain is high," the predicate *is high* may be translated "endures as a high object." A judgment then consists in the union of a space concept with a time concept, and the result is a space-and-time concept.

Kinds of Judgments.— Judgments may be positive or negative; particular or general, as: "Birds fly;" "Dogs do not fly;" "All horses are vertebrates;" "Some horses are black."

In positive judgments, the subject never exceeds the predicate in extension. Thus in "This butter is strong," the subject concept *this butter* (happily for the boarder) is not as extensive as is the predicate *is strong* (*butter*).

Relation of Judgment to Conception.— Judgment should not be thought of as a less fundamental process

than conception. The mind does not first make concepts and then proceed to piece these concepts together to form judgments. It is probable that the two processes appeared in consciousness together and developed together.

For purposes of study, conception and judgment have been separated from each other and recognized as two separate processes, but in our conscious life they are inextricably bound together, each involving the other.

Exercises

1. Illustrate the differences between *concept* and *percept* by describing what is meant by the concept and the percept of the following: *circle, lion, goodness, ratio, ocean*.

2. What is your everyday concept of *house, dinner, book*.

3. What is your thought symbol for *beauty, truth, United States, Congress, war, learning, mercy*?

4. Give an instance of mistaking symbol for meaning.

5. Why is *spit* vulgar and *saliva* admissible? Why is *serpent* more dignified than *snake*?

6. Give an example of a subject that is equal in extension to its predicate.

CHAPTER VII

REASONING

Reasoning may be used broadly as a synonym of thinking, and *reason* and *intellect* have practically the same meaning. But it is convenient in psychology to use *reason* and *reasoning* in a more restricted sense. Here *reasoning* will be used as meaning *a logically connected chain of judgments resulting in a judgment which is a conclusion*.

Hence reasoning is explicit judgment, as judgment is explicit conception.

So we have —

Concept + concept = judgment.

Judgment + judgment = chain of reasoning.

There are two kinds of reasoning, *inductive* and *deductive*.

INDUCTIVE REASONING

Our one source of knowledge is experience. But we should be in a sorry plight if we could not anticipate experience. A child touches a red-hot stove. Very well (or rather, very ill, from the child's standpoint), he *knows* something from experience. What does he know *directly* from experience? "That the stove must not be touched." Not at all; that is a very complex *conclusion*. "That he will burn his finger again, if he touches the stove again." Yes, he knows that, but

not directly from experience. In fact, he can hardly be said to know anything directly from experience; or rather, experience itself, as he knows it, is a complex series of conclusions he has arrived at more or less logically. He knows that if he touches that stove again he will again be burnt; and he knows it as the result of a complex mental process. This process we are now to study.

The hot stove burnt me, is the first judgment, which comes as near being pure experience as is possible. *Like causes have like results*, is the universal postulate which we all subconsciously make. *The stove seems to be in the same condition now as it was a moment ago, when I burnt myself, hence if I touch the stove again, I shall make all the conditions the same as at my former experience.* This now completes the chain of reasoning, except for the conclusion: *The result would be the same: I should be burnt.*

In this way we anticipate experience, and profit by experience. Inductive reasoning is hence a way of getting ahead of experience, of making it unnecessary.

The rational world is an organized unity lying between the two poles, *law* and *fact*. Induction is a method for getting from the facts to the law.

Complete Induction. — If every instance, or fact, under a certain class, or law, is examined, we can arrive at a truth that is as certain as experience itself. Thus we may say that for half a century there has been no frost in Iowa in July.

But complete induction is seldom possible and sometimes not desirable. For example, farmers in Minnesota will plant corn about the middle of May, a long

series of inductions having told them that it is generally safe from frost at that time. They cannot in the nature of the case wait until all Mays are gone before they assert that the middle of May is safe, and plant their corn.

The story is told of a gentleman whose "man" brought home a box of poor matches. "Next time you buy matches, test them," said he to his "man." The next box of matches proved even a worse disappointment. Not one of them would light. "Why didn't you test them?" the servant was asked. "Oh, but I did," responded he; "I tested every last match in the box." He had made a complete induction.

So practically we must be satisfied with a limited number of inductive examples. In this way, to be sure, we never reach absolute certainty, but we get what is just as useful, pragmatic certainty. We always try to apply to the problem the axiom, "Like causes produce like effects," which removes the problem from the sphere of induction, and makes it deductive. But generally the problem cannot be made to come under the law of like causes fully, since it is hardly possible to become absolutely certain that the causal situations are absolutely alike. Sometimes we come pretty near it, though.

A chemist mixes certain chemicals. He knows the chemicals by certain characteristics. He confidently predicts the result because he has mixed the identical kinds of chemicals in the identical way before, and he is sure of the uniformity of Nature: that she will respond to-day exactly as she did yesterday to the same experimental question.

Knowledge based on Authority.—Much of our knowledge is based on authority. A small percentage of what we know is based on our own experience or reasoning. We have been told so, hence we know. Thus my “knowledge” of Africa is wholly based on faith in human authority. All I know of what happened before I was born and most of what I know of what has happened after I was born I know on human authority. Most of what we know, we know on what lawyers call “hearsay evidence.”

Our belief in authority is based ultimately on an induction. We notice that the vastly greater number of assertions which we have had a chance to test, made by accepted texts and encyclopedias, have turned out to be true; hence we infer that such authority may be trusted in this case. But the case is usually more complex. The fact that other people with more experience than ourselves recognize certain authority, makes us accept it. Thus the average scholar takes the statements in his textbooks entirely on authority.

Knowledge based on Faith.—Only *through* experience do we gain knowledge; but there is some knowledge which we did not gain directly *from* experience. Thus I know that the whole of anything is equal to all its parts, that the same object cannot be in two places at the same time, that it is impossible to conceive space as limited, and all other axioms, to be true without depending on experience. Of course I could not have these ideas or any other ideas, if I had not had experience. But as soon as I begin to perceive and think, I know that these self-evident truths are true, without any testimony from experience.

Some thinkers claim, however, that this seemingly immediate knowledge of ours is the result of the experience of our ancestors. Thus our assumption that every effect must have a cause, is said to be based on the universal experience of the race in the past. This reasoning is, however, based on a misconception of the nature of our *a priori* or self-evident knowledge. It is not that we simply naturally assume a certain proposition to be true; it is more: we *cannot* conceive anything *different* to be true, and we see directly that the proposition *must* be true. Besides, in many cases, experience cannot possibly teach these truths.

Take the axiom last referred to: Every effect must have a cause. This cannot be verified by experiment without using the most refined scientific instruments and methods. Experience seems in fact to teach just the opposite. Trees shoot up from the ground, as if by magic, and no visible or tangible cause can be found. The wind bloweth whither it listeth and we know not whence it cometh. In fact, we can never in ordinary experience trace the chain of cause and effect more than a link or two, and often not even that. And still, as soon as a human mind really knows what is meant, it will always assent to this proposition. Yet few uneducated persons recognize the truth of this axiom when it is mixed in daily experience. Thus countless lives have been spent in seeking for "perpetual motion"; and inexplicable events are dismissed from discussion as having "just happened." But as soon as such a person clearly sees the implication of the statement of the law of cause and effect, he at once assents to it.

Or, take another axiom just mentioned: The same object cannot be in two places at once. Experience is wholly against this axiom. In hundreds of classes of objects the individual objects are so similar that it is impossible to tell one object from another. In a bushel of peas, why don't we assume there is only one pea appearing in a thousand places at the same time? When twins are so exactly alike that one cannot be told from the other, why don't we assume there is only one person who exists at once in two places? So, I think it is safe to assert that we know some things to be true because of the very nature of the mind.

But evidently even here we must base our knowledge on faith, faith in the integrity of our intellect. It is conceivable that our minds might all be insane on some point, and hence it would be impossible for us to detect our error.

Knowledge gained from experience is also based on faith. Experience is always gained through the senses, and is reduced to knowledge by the process known as perception, and preserved by memory. Hence, we must trust our senses and our memory in every case where we rely on experience. Witness saw defendant strike plaintiff; he is sure of it. Now his certainty is based on: (a) his faith in his sense of sight and his perception (it might be an hallucination), and (b) his faith in his own memory.

Laws or *principles* may then become ours in two ways. Either we gain them by inductions from experience, or they are simply awakened in us by experience and then elaborated or deduced. The latter are what we call self-evident truths. Thus the law of gravitation was

induced from experience, while it is quite possible that the law of falling bodies was evolved from reason alone. The arbitrary fact, however, that if a body falls 16 feet the first second, its speed must be 32 feet per second at the end of first second, we need no experiment to know. The body began with no speed at the beginning of first second. It passed over 16 feet acted on by a constant force. Hence 16 feet per second must be the average speed, and the other extreme to 0 speed must be 2×16 feet or 32 feet per second.

Thus all geometry, and much of other mathematics, is deduced entirely from the axioms awakened by experience in the mind. Much of physics is *a priori* deduction.

All pure mathematics is based on laws of consciousness alone, as mathematics is the science of time and space as we conceive them.

DEDUCTIVE REASONING

From the law, the principle, we can descend the logical ladder to the fact, the instance; from the general we can arrive at the particular, thus reversing the process of induction. Deductive reasoning, hence, consists simply in recognizing a part of a concept as a part.

The Syllogism. — The explicit form of reasoning is the classical syllogism, of which there are four fundamental types. Of these four forms the following may be considered basic : —

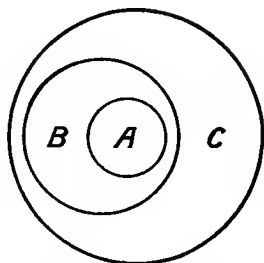
Water expands when it freezes.

The liquid in this glass is water.

Hence the liquid in this glass will expand when it freezes.

The logical relations may be expressed by the diagram shown below :—

B is (in) C (Major premise).
A is (in) B (Minor premise).
Hence A is (in) C (Conclusion).



The first sentence is called the major premise; the second the minor premise; the third the conclusion. Now the predicate of the major premise, *expanding when freezing*, has the greatest extension, and includes the subject, *water*, which is also the predicate of the minor premise. Hence the subject of the minor premise and of the conclusion, *the liquid in this glass*, is *a fortiori* included in that which includes its predicate, *water*.

PEDAGOGY OF REASONING

Logical Relations. — Reasoning consists in perceiving the relations of ideas to one another. Hence put all your attention on the logical relations. The facts will take care of themselves. To be exact, the fact is nothing more nor less than a center of logical relations, just as modern physics is inclined to view the atom, the unit of matter, as simply a center of forces. In studying a battle, for example, don't clog up your mind with "60,000 men, no cavalry, 6 o'clock in the morning, bombardment, charge, retreat ten miles on north road," and the like. These facts, *thought of as mere facts*,

will remain barren and cold in the mind, as so much lumber. Instead ask yourself: "*Why* 60,000 men? He could get no more, as of the army of 200,000 enlisted, only 75 per cent were effective, and of these 150,000, 50,000 were too far away to reach the commander and 40,000 had to be left guarding the route to the base of supply. The enemy were estimated at only half of this number, but the enemy fought on the defensive and in their own country; hence conditions were fairly equal." Similarly: "*Why* had he no cavalry? Would he have been benefited by exchanging 10,000 infantry for 10,000 cavalry? *Why* did he attack at 6 A.M. Was this a mistake?" In this way study becomes reasoning; in this way we learn to think.

Application of Laws to Particular Facts. — Never be satisfied with your own or your pupils' knowledge of principles or laws until you have applied them to concrete examples and particular facts. This is the main reason for the existence of laboratories and experiments. A student does not know what oxygen is until he has generated it, experimented with it, stuck glowing splinters into it, and noticed how they have suddenly flared into flame. A psychological principle, like the one we just now discussed, was not understood by you half so well before you read these illustrations, and you will understand it better still when you have studied the problems and examples at the end of the chapter.

Sympathy as an Aid to Understanding. — Get into sympathy with your subject; for contrary to the antique slander, love is not blind, love is the very eye of the soul. No study, from botany to theology, can be studied right, until we love it. No student does his best until

he loves his study. It is not because he *will* not, as teachers so often claim. He *can* not.

Intellectual Honesty. — While we must have sympathy as an asset to right thinking, we should at the same time be careful lest our sympathies stand in the way of intellectual honesty. How few fathers can judge fairly between the characters and deeds of their own darlings and those of the neighbors' "brats." If our own family, or party, or church, or nation makes a mistake, it is very venial, a mere bagatelle, not worth mentioning; while if the blunder belongs to the other side, it is a scandal, a crime, a sure indication that the whole institution is rotten.

Now, the cure isn't to have less sympathy, it is to have more, and more catholic sympathy. We should be less selfish, and that means not to love self less, but the other fellow more. A broader view, less provincial and more balanced, is the right prescription.

We need perspective in our thinking. If we might stand away some distance from ourselves so as "to see oursel's as ithers see us; it wad frae monie a blunder free us."

"Original" Thought. — Many teachers imagine that in "development" lessons and in the laboratory they make their pupils original, pioneer thinkers on a wide range of subjects. This is too high praise. They make them simply thinkers. The chances are that before the subject was developed, before he experimented, the pupil had no conception at all that was even passably satisfactory. The conception he gets now is not original by any means. It comes straight from the teacher, the text, and the experiment. But

then, most of our thought, our steady diet of thought, is *copied* thought. This following in the footsteps of another thinker is no mean art, and is one in which we should become experts. It is the most useful kind of thinking, so let us not despise it.

Original thinking is a dangerous and difficult art, and usually barren of useful results. Hence few attempt it. Still, as a bracing exercise, and as a moral stimulant, it should be encouraged.

SUMMARY OF STAGES OF MENTAL ACTIVITY

The stages of mental activity may be thus classified : —

A. The Fundamental Basal Stages

ACTIVITY	PRODUCT
1. <i>Perception</i>	<i>Percept</i>
2. <i>Memory</i>	<i>Image</i>
3. <i>Imagination</i>	<i>Image</i>

B. The Complex Developed Stages

ACTIVITY	PRODUCT
1. <i>Conception</i>	<i>Concept</i> = a unity of notions, or attributes
2. <i>Judgment</i> = explicit conception	<i>Judgment</i> = a union of two concepts to form a new concept
3. <i>Reasoning</i> = explicit judgment	<i>Syllogism, Chain of Reasoning</i> = a union of judgments to form a new judgment

Exercises

What is wrong in each of the three following problems?

1. A certain gardener, ninety years of age, was congratulated on his birthday in May, and wished many returns of the day. He responded that he felt sure he would at least see another New Year, "for," said he, "I have noticed in the garden that if anything lives over the month of March, it is sure to live the rest of the year."

2. No cat has four tails.

This dog is no cat.

Hence he has four tails.

3. All lions are animals.

All lambs are animals.

Hence all lions are lambs.

4. A person who had never told a truth in his life said, "I never tell the truth." Was he then speaking the truth?

5. What is the best way of teaching what is meant by an object's being a good conductor of heat?

6. What is the best way of teaching what is meant by "the state legislature"?

7. In determining the botanical name and classification of a plant, what kind or kinds of reasoning do you use?

CHAPTER VIII

HOW WE THINK: ATTENTION

THREE PHASES OF THE KNOWLEDGE-MAKING ACTIVITY

WE may discuss the intellect both from the standpoint of the activity that produces knowledge and from the standpoint of the product.

In the previous discussion we have taken up the *stages* of knowledge. We are now ready to study the *knowledge-making activity* of the mind, or, as it might also appropriately be called, the *art of thinking*.

We shall find a surprising similarity in the activity of the mind in every stage of knowledge. Reduced to its elements, the behavior of the mind does not differ much when it reasons from its activity when it perceives. Here again we find that we cannot divide the subject into parts, but we can find distinct aspects of the intellectual activity. These are —

Attention;

Analysis and Comparison;

Association, or Synthesis.

In this chapter, we will turn to that phase of the mind's activity which we call *attention*.

MEANING OF TERM "ATTENTION"

Earlier in this book we compared consciousness to the field of vision, which consists of a clear and distinct

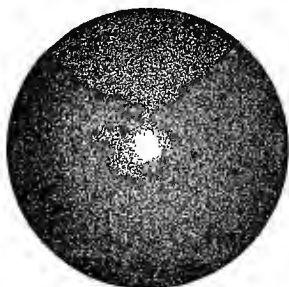
center surrounded by a field which gradually decreases in clarity and definiteness, until it finally vanishes in a "fringe" of obscurity and confusion.

Consciousness, however, has a power which the eye has not. *It can vary the degree of its concentration.* When we so will we can withdraw the energy of consciousness from the periphery of the field of consciousness and center our mind narrowly on the focus. This renders the circle of distinct consciousness smaller, but it becomes in proportion more vivid. We call such an effort a concentration of attention.

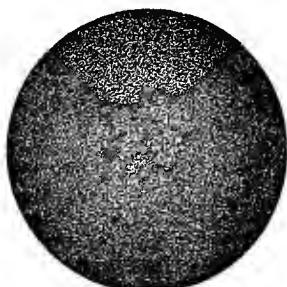
Attention, then, *is the centering of consciousness on a portion of its contents.* As Professor James says, one of the elementary characteristics of consciousness is its partiality for certain parts of itself. The vaster portion of the mind is in the shadows of the twilight which ranges from nearly complete consciousness to a profound darkness that we cannot distinguish from the absolute night of unconsciousness. This twilight zone is called subconsciousness. When the mind is hard at work, attention sharpens to a fine point, and we think vividly of a small range of topics, and almost not at all of neighboring fields of thought. When the mind rests, it "flattens out," and spreads itself over a larger area, but as the light of thought is diffused over so wide a territory, the whole field is in an intellectual penumbra, and nothing distinct is before the mind. The diagrams on page 76 illustrate this.

The following diagrams also illustrate the difference between the idiot's mind and the genius' mind. The main difference among minds intellectually is difference in power of concentration. Carlyle's definition

of genius as "an infinite capacity for taking pains" is literally correct; and translated into the language of psychology it would read as follows: an ability for extraordinary concentration of attention. Only by concentrating the mind can we be painstaking.



CONCENTRATED ATTENTION



DIFFUSED ATTENTION

Thought training, then, is mainly an education of attention, for he who can concentrate his attention at will can do all with his intellect that it is capable of being trained to do. He is intellectually trained.

CHARACTERISTICS OF ATTENTION

(a) The field of attention shades off gradually into that of subconsciousness. This will be discussed more fully in the chapter on subconsciousness.

(b) *Attention is constantly moving.* It is impossible to keep on thinking of precisely the same idea for any appreciable length of time. You will find that as soon as you decide to think of one subject and of one alone and only one phase of that subject, you straightway begin to think *about* the subject. That means *around* it. The attempt to fix the attention on one object and

not allow it to move will, if continued long enough, bring on hypnotic sleep. The reason why a genius can attend so intently for a long time to a topic of thought is, as Professor James says, because in his mind the topic is constantly developing, showing new sides, details, and consequences, while the idiot cannot fix his thoughts on anything, because in his mind the idea is sterile, and remains the same. Hence, as his attention cannot rest, it must abandon this idea for another.

(1) *Attention moves in pulses, waves, periods.* This follows from what has been said. Hence our attention does not move like a boat or horse, in a constant and evenly rapid motion, but in leaps and bounds of uneven length.

As a corollary to (1) we deduce (2) that *Attention varies constantly in intensity.* We do not think with the same intensity for two consecutive minutes.

How does the student work, for example, in solving a problem in algebra? He adopts a certain hypothesis, and then concentrates his attention with all his might on the problem in applying this hypothesis. He brings all the factors of the problem together in the limelight of his concentrated attention, only to find that his hypothesis is untrue. Then he relaxes, for a moment at least, and casts about leisurely for another hypothesis. A lecture in which everything is equally emphatic and in which therefore an equally pitched attention is required, is hard to follow. Attention refuses to be an ever constant stream. The orator, therefore, gives relief to his presentation by having his emphatic passages separated by lighter material

that does not demand so close attention. Attention is never sharpened up to its finest point for more than a few seconds at a time. Then it relaxes, the mind "flattens out," and rests. Thus our attention works in pulses or beats, like the heart, or the respiratory organs. The two motions of attention — its varying intensity and its movement over its object — are combined so as to make the intensity greatest when the movement over the object is slowest.

This varying intensity of attention has brought about the division of time into certain periods. We have the *diurnal wave* or *period*, which consists of a day and a night. During our waking hours, our attention is at least in some measure concentrated. Psychologically, sleep is the total or practical absence of attention. Dreams are very imperfect and abortive attempts to center the attention during sleep. In sleep our whole being sinks into subconsciousness. When we awake, we concentrate our mental powers. "We pull ourselves together," literally and begin again to attend.

Usually we divide the day into three long periods of attention, separated by rests: forenoon, afternoon, evening, separated by meals and the nightly rest. These three periods may be called the *session periods*, if a name must be attached.

The length of time the mind is engaged in thought in the same general direction is the next period. In school work this may be called the recitation, lecture, or study period.

(3) *Attention tends to move rhythmically.* Do not confuse this with (1). Attention always moves in

pulses or waves, but it does not always move rhythmically. Not all periodicity is rhythmic, for rhythm consists in regularly recurring series of pulses. It is a marked characteristic of the mind that it prefers to act rhythmically.

This is the reason why poetry is more pleasing than prose, and is the essential charm of marching and dancing. Here is where doggerel gets its great vitality. This is the reason that children so easily fall into the singsong habit in reading. Thus the mind will put a rhythm into regular successions of sound, even when the rhythm is wanting or when this rhythm is too monotonous, as in the ticking of a clock or the click of the wheels of a railroad car. These may with a little imagination be made to recite poetry, sing tunes, and repeat rhymes.

HOW THE MIND ACTS IN ATTENTION

So much for the movements of attention. After the mind is once concentrated upon the chosen portion of the contents of consciousness, what then?

First, remember the mind is never passive; it is always essentially active. The mind paints the pictures we see, makes the music we hear, and produces impressions and feeling, just as certainly as the mind makes its own judgments and syllogisms.

When now the attention is centered upon any portion of the contents of consciousness, it acts at once as a solvent and a cohesive. The mind picks apart and puts together again. It analyzes, compares, and associates. What it does, depends on the store of knowledge at its command.

This analysis, comparison, and synthesis is done according to the laws of the mind, which laws are also the laws of the universe. The result is thought, and if the mind is normal and follows its own laws, knowledge. The work of the mind corresponds to the truth as it is in the universe.

KINDS OF ATTENTION

The practically important division of attention is into *involuntary* or *spontaneous attention* and *voluntary attention*.

Involuntary. — Involuntary or spontaneous attention is the attention which comes as the reaction of the mind to certain stimuli. In studying sensation we find that the mind is so constructed that specific stimuli are answered by the mind by specific reactions. A stimulus, whether it be an external stimulus or a suggestion, awakens some impulse or desire. As soon as this happens, our whole soul flows to this point, we attend to it. A famished person in the presence of food concentrates involuntarily his whole consciousness on food getting. A mother, caring for her child, will find her attention centered on that child without any effort of thought. The next moment after making acquaintance with the wrong end of a hornet, it seems to us as if our whole being were in that sting, and doubled up in pain at that. The motive (instinct or desire) has in this relation generally been called *interest*, and shall be so denominated here. Reflex or involuntary attention, then, depends on interest.

Voluntary. — The second kind of attention is a direct product of the will. Man has the power to

concentrate his mind by sheer effort on that which is not interesting. We may hence say that voluntary attention depends on *effort*.

How the Mind economizes Voluntary Attention.—Voluntary attention is exceedingly expensive; spontaneous attention costs nothing. Hence we have learned to get along with very little of the expensive kind. Just as for many purposes gold plating is just as good as solid gold, so here with the precious metal of the mind. For instance, I would rather gossip with my neighbor than study to-night. If I obeyed the spontaneous impulse, gossiping is what I would do. But I inhibit the expression of this impulse, and by sheer effort direct my attention to my lessons. I force myself to read the first lines and to think upon what I read. This is hard work, but it can be done. Not for a very long time, however. Few people could stand the struggle for more than a quarter of an hour. But happily, I soon get interested in my lessons. This means that some ideas I have forced myself to gather from the book have acted as a stimulus to my intellectual interest (we call it curiosity when directed to trivial things). Now I no longer need to use voluntary attention. My interest supplies me with reflex attention. Then if I am a well-conditioned student I will run like a self-igniting engine, one that produces the stimulus that sets it to work.

Spontaneous or involuntary attention is the iron of the mind. It is the material that is used in great quantities in every conceivable need. It is plentiful and cheap, and "fills the bill." Voluntary attention is the gold of the mind. It is very expensive and is

seldom used, but when we want it we must have it, for there is nothing that can take its place.

INTEREST

Important Laws of Interest. — Interest is the attention-compelling element of instincts and desires. More especially it is the intellectual and æsthetic interests with which we are here concerned. Some of the practically important laws of interest are the following: —

(a) *We have no intellectual interest in that which we know perfectly.* After a teacher has gone over the elements of a subject until he is perfectly familiar with them, this elementary aspect of the subject has no particular attraction for him. *Nor have we any interest in that which is perfectly unknown to us.* We do not care to listen long to a language that is totally unknown to us. *But we are interested in that which is partly known and partly unknown.* All our intellectual interests are in this twilight zone.

(b) *We all have a more or less well-defined sphere of interests.* In order to be interesting, a subject must be brought within this sphere. In other words, it must be brought into relation with us. Thus, children are more interested in child life than in adult life; a merchant is more interested in market quotations than is a clergyman, even when the merchant is not contemplating buying anything.

(c) *Interest in a thing is not to be confounded with delight in a thing.* If when groping around for a match in the still watches of the night, you step on a tack whose point is up, you become suddenly filled with an

absorbing interest in the task; but you certainly do not delight in it.

Pleasant interest is more economical as a motor force for attention. If pleased as well as interested, a person can do several times as much work, both mental and muscular, without fatigue, as is possible if the work is accompanied by fear or disgust. This is one strong reason why we should make our pupils like their work. This is also the reason why natural interest is better than artificial. When a pupil studies from fear of punishment or from desire for reward, he generally dislikes his work; and this disgust with his work is a constant and heavy drain on his energies. There is sound psychology in the slang phrase we use to express contempt and disgust: "It makes me tired."

(d) *The mind is bound to be busy with something*, as long as it is in a waking condition. Hence, *we can interest ourselves in almost anything by shutting off all more attractive stimuli*. This is the fundamental principle applied by the schoolmaster since time immemorial. This principle every one must apply who would accomplish some serious study. He must by using voluntary attention resolutely shut off all alluring excursions of the mind into what temporarily appear to be more attractive regions.

THE PEDAGOGY OF ATTENTION

Alternation of the Important and Unimportant. — From the laws of attention just stated we gather that to gain best results in attention, *there must be relief and perspective in presentation*. Monotony is the great

enemy of attention. To secure attention, alternate the important and the unimportant. If you attempt to make everything striking, nothing will strike.

Value of arousing Interest at Beginning of Work. — At the beginning of a recitation, session of school, lecture, book, article, or drama, the listener or reader is usually interested in something else, and entirely ignorant and uninterested in what is to come. Hence at the beginning of any period of attention, *the subject should be made as interesting as possible*. Notice the alluring way in which novelists begin. Almost every political orator begins with a story alleged to be funny. The teacher should try to start every recitation with something more than ordinarily interesting. This is done in order to make voluntary attention unnecessary and to substitute spontaneous attention. This is one important reason for "opening exercises," and this defines their nature. Opening exercises ought to contain something the pupil can do, to enlist his interest in the school. Hence the value of singing, best of all, motion songs.

The Time for the Hardest Work. — *As soon as the pupil's or audience's attention is "caught,"* that is, as soon as voluntary attention gives way to spontaneous attention, *give the hardest and least interesting work of the period*. The pupil is rested now. He has more energy now than he will have during any later time in the period. Therefore, put your hardest work, like arithmetic, in the early part of the morning session. Ask your test questions early in the recitation.

When the Work should be made Easier. — As the pupils' fund of energy is constantly decreasing, ease up

the work as the hour or day progresses, and if possible increase the stimulus of interest. Towards the end of the period you may have to use your funny stories.

Value of Closing Exercises. — *End the period* (recitation, address, session, day) *in a blaze of glory and interest*, leave a good taste in the mouths of the pupils for the next recitation, the next day of school. For that reason, I would recommend closing exercises at the end of the school day. A scientific experiment of the spectacular sort, a story read by the teacher, or a song sung by the school, are good varieties of closing exercises.

Teaching Pupils the Value of Powers of Attention. — *Acquaint your pupils with the immense value you place upon the power of attention.* Almost the whole secret of good thinking is a trained power of attention. As attention is one aspect of the *whole* intellectual activity, the preceding sentence is self-evident.

Exercises and Illustrations

1. Think of a pin's head for one minute. Notice how long a period of time that minute seems. Could you keep your mind on the subject the whole time? Did it ever for a moment remain on one portion of the subject?

2. This story is told of two Eastern hermits who lived together. Basil complained that he could not keep his mind on his devotions, that worldly thoughts would creep in. Cyril rebuked him for being so weak. Basil felt injured and said that perhaps even brother Cyril might find it hard, if he observed himself closely. The end of it was that Basil wagered a donkey that Cyril could not say the Lord's prayer without allowing some worldly thoughts to intrude. So Cyril began, but when he came to the fourth petition, he stopped and confessed:

“ Brother, I lost, for as I said ‘ Our daily bread,’ I thought, ‘ I wonder if I will get a bridle too with the donkey.’ ”

3. If you “ skim ” a book, why do you skip the solid pages and read the ones broken into small paragraphs and conversation?

4. Mark Twain, in a story, makes the wheels of a train say : —

“ Punch, conductor, oh, punch with care,—
Punch in the presence of the passenjare,
A blue trip slip for a five-cent fare,
A buff trip slip for a three-cent fare,
A red trip slip for a ten-cent fare.
Punch, conductor, oh, punch with care,
Punch in the presence of the passenjare.”

This so fastened itself to the mind of a certain man that he could not get rid of it, and told it to his pastor. The pastor caught it and found himself giving it out as a hymn at a funeral.

5. What psychological limit is there to the proper length of the paragraph?

CHAPTER IX

HOW WE THINK: ANALYSIS AND COMPARISON

FUNCTION OF ANALYSIS AND COMPARISON

It would be equally correct to write "Analysis, or Comparison," for analysis is essentially the same as comparison. We always analyze by comparison. Thus, in abstracting the attribute *red color* from the concept *red apple*, we compare a red apple with, say, a green one. We note that the difference is one of color, and individualize the color *red* by comparing it with the color *green*.

Attention is the whole knowledge-making activity. Consciousness *concentrates*, we have learned, on some small portion of its contents. What does the mind (consciousness) *do* with the material before it? In brief, the mind makes order out of confusion, a cosmos out of chaos, something of nothing-in-particular and everything-in-general, and it does so by comparing one sensation, perception, or concept with another and discriminating.

Analysis. — Chronologically, everything is done at the same time,—comparison, discrimination, association, individualizing, and generalizing. Each one of these aspects involves all the rest. But logically, perhaps, individualization may be said to be first. That is, whether perceiving, imaging, judging, or rea-

soning, the mind must first get *units* to work with. When we first peer into a distant scene, we see nothing but a confusion of patches of colors and shades. We begin to perceive by making out a tree here and a man there. We have individualized these objects. When we try to solve a problem in algebra, we first have a chaos of mathematical relations. We begin to see light when we can definitely pin down one mathematical idea, and say, for example, let x equal the distance traveled the first day.

Now, how do we do it? It is by *analysis, discrimination*. We separate that idea from every other idea. We center our attention on it, and withdraw our attention from every other idea. The mind acts like a cleaver. It makes a gash between this idea and every other. Watt noticed that the cover on his aunt's teakettle bobbed up and down. He centered his attention on this bobbing cover and escaping steam and singled out of this group of ideas, as most significant, *the force of steam*. "Steam has power to lift that cover" must have been the form of his idea. This idea led to the invention of the steam engine.

How Comparison aids Process of Analysis. — But of what does the act of analysis consist? We shall find that in every case the act of analysis involves an act of *comparison*. I notice that sugar is sweet. I compare the sweet taste with the taste that just preceded it, and thus it gets individuality. When a person has eaten pancakes and sirup he cannot taste the sugar in his coffee. How do we notice the moon in the sky? By comparing the bright disk of the moon with the darker sky. If the whole sky shone as brightly

as the moon, we could not see the moon at all, or, more precisely, we could not individualize the moon, we could not discriminate between the moon and the rest of the field of vision.

In the formation of concepts we call this analyzing activity *abstraction*. Thus, in order to add the attribute *ferocious* to the concept *lion*, I must compare the action of the lion with, say, the lamb, and find that they differ. This comparison makes it possible for me to segregate the quality *ferocity* and make it an individual object of thought. If all animals were ferocious and all ferocious beings animals, it is quite certain that I should never have distinguished between *being an animal* and *being ferocious*, because I should have had no chance of making a revealing comparison.

PEDAGOGY OF ANALYSIS AND COMPARISON

(a) *Limit the field of analysis to the smallest possible area.* This is the fundamental rule for successful analysis, and also for comparison. The naturalist uses the microscope. The lawyer takes up his opponent's brief, point by point. The critic will dwell fondly on a comma or the quantity of a vowel. The successful mathematician takes up his problem, bit by bit, and largely because he can make the bits so small, is he so successful.

(b) A corollary of the first rule is the following:—

Exclude every factor and element from attention except the two under consideration. The minimum is two; we cannot think of only one unit of thought. There must be substance and attribute in the concept, subject and predicate in the judgment, premises and con-

clusion in the reasoning, the object and its environment in vision, sound and silence in hearing, and motion and rest in motor ideas.

(c) *Be in no hurry to generalize.*—Almost every novice in thinking, and the great majority of those who have had experience and ought to know better, will generalize from the first bit of comparison, the first streak of analysis. Most hallucinations of the senses are due to this tendency. John, late in the park at night, hears a few indistinct words. He compares these sounds with some memories of words; these sounds partly correspond to “Money or your life,” and his subconscious mind, which does the hearing for him, makes him hear the words “Money or your life” very distinctly; so he flees in terror from the scene, and reports to the police that he was held up in the park. Now the truth is that he compared and discriminated only these sounds:—oney—ife, and if he had not generalized so abruptly, he might have found that on the other side of the hedge was a swain kneeling before his lady love, entreating: “Honey, be my wife.”

Exercises

1. When a tea taster tests teas, with what does he compare each sample? Notice that taste of sample A must be out of his mouth before he can taste sample B. How can he then compare?

2. In counting objects, what comes under the head of comparison and analysis?

3. What part do analysis and comparison play in our consciousness when we are listening to a quartet singing?

4. The famous dervish saw that the impression made by one foot of the camel was always much fainter than those of the others.

He concluded that the camel was lame in that foot. Show his analysis.

5. Give some cases of analysis and comparison from novels.

6. Show that analysis, comparison, and attention are all involved in the same mental act.

7. What act of analysis do we perform in perceiving a sail at the horizon at sea?

8. In scanning a line of poetry show what acts of analysis and comparison we perform.

9. In the following selection point out what are cases of analysis and what of comparison:

"One of the expensive factors in the production of cotton was the removing of the seeds, as long as this was done by hand. When the cotton gin was invented, this factor became so small compared to what it had been before, and compared to the value of the cotton, that it was almost negligible. Hence cotton became a paying crop, and a staple was found that could be raised by slave labor at great profit."

CHAPTER X

HOW WE THINK: ASSOCIATION, OR SYNTHESIS

THE process of *association* is another aspect of thinking, or the knowledge-making activity. In making knowledge, the mind connects, unites, relates, and organizes its contents. This integrating process is called association. It is the synthetic activity of the mind. Care should be taken to hold fast to the truth that attention, analysis, comparison, and association are but different aspects of one mental activity. When the mind attends, it associates and discriminates.

KINDS OF ASSOCIATION

Logical Association. — There are two kinds of association: *logical* and *mechanical*. In most concrete cases, however, the two varieties are mixed. Whenever the mind sees a reason why any pair of ideas should be associated, we may call the association logical. Thus, cause is logically associated with effect, the part with the whole, the purpose with the means. All that is necessary is that the mind should grasp this logical relation. As soon as the mind is in possession of this relation, the ideas so related are permanently connected in the mind. Thus, tobacco was a staple export in colonial times, and had a practically unlimited market.

Therefore, it paid to raise tobacco in great quantities; hence great plantations. Tobacco culture requires a great deal of simple manual labor. This was furnished cheaply by the negro slaves. Thus, slavery was profitable in the tobacco colonies. Therefore it survived there. This chain of ideas is held together in the mind by logical relations. All that is necessary to associate this series of ideas is for the mind to be clearly cognizant of these relations.

Mechanical Association. — The second kind of association is a connection of ideas in the mind without reference to any intrinsic thought relation. Its fundamental law may be stated thus: —

When two ideas come contiguously before attention, they become associated. Every repetition of contiguity strengthens the association.

Contiguity may be of two kinds: simultaneous and successive. Thus, if we think simultaneously of Tom and Dick, Tom and Dick will be associated in the mind. This is simultaneous contiguity. But if we repeat the letters in the alphabet in order a great many times, that order will be firmly fixed in the mind. This is successive contiguity. This is the usual statement of the case, and it is convenient and simple. Under a more rigid analysis the two cases, the “simultaneous” and the “successive,” may be shown to be identical. Whenever two ideas occupy the field of clear consciousness together, and the mind’s center of attention travels from the one to the other, the ideas are associated. When we think of two ideas simultaneously, the mind’s center of attention oscillates rapidly from one to the other. When the ideas pass through the mind in suc-

cession, they are also simultaneously before the mind ; for in repeating, for example, the alphabet, *a* is not wholly out of the mind when we say *b*.

Similarity is often given as an associating force, but it can easily be proven that similarity is only a case of the fundamental law given above. Thus friend A may remind us of friend B, because their features are similar, both having "pronounced" noses. When I see A, I see his nose. That nose is as to size and shape identical with B's nose, but B's nose has occurred in my mind together with the rest of the features of B ; hence it is associated with the other features of B, and therefore A reminds me of B.

Subordinate Laws of Mechanical Association. — The more *vivid* the experience is which connects two ideas, the stronger the association. Thus, we are not likely to forget the place where we saw a stroke of lightning within a rod of us, or what happened to us in a shipwreck.

The more *recent* the association, the stronger it is. This is known and depended on by every pupil who crams on the evening before examination.

THE PHYSICAL BASIS OF ASSOCIATION

The physical basis of association is supposed to be the same as that of memory. Corresponding to every psychosis there is a neurosis. For every idea before consciousness in attention there is a corresponding reaction in the brain. The series of brain events and of mind events run parallel, and the one occasions the other. Careless and materialistic thinkers talk of ideas, sensations, and thoughts as coursing through the nerve

cells. Many psychologists, of whom we have a right to expect better things, persist in this unscientific romancing, and use "brain" when they mean "mind," and speak of "associations in the brain cells" and the like. It may safely be asserted that we do not know one practical truth more about association because we know or think we know what is the physical basis of association. It does, however, satisfy our theoretic interest to have a scientific reason for the fundamental law of mechanical association.

The physical basis, then, of association is the same as that of memory and habit. Mechanical association may presumably be supposed to depend entirely on these modifications of the structure of the nerve center which we call the reaction paths of sensory and motor nerve currents.

ASSOCIATION AN ASPECT OF EVERY MENTAL ACTIVITY

Psychologists have generally confined their attention in studying association to the phase of it connected with memory. But we must not forget that association is an aspect of the intellectual activity that is present in every stage. Thus, in perception there is association. For example, in hearing a quartet sing, while we discriminate the four parts as four distinct series of sounds, we also put the four together into a harmonious whole. This uniting of the four parts into a harmony is association, synthesis. In seeing a landscape, we associate the color sensations, the interpretation of the motor sensations of the muscles of the eye into the whole which we know as the percept of the landscape. We often associate the images of

one sense with another, so that when we perceive with one sense we imagine the corresponding image with the other. We hear a mosquito and immediately imagine the visual form and the sting of the little tormentor.

We cannot compare, analyze, or attend without associating. In the very act of making a distinction between two notions, we associate these two elements of thought. Thus, when I say, "The moon is brighter than the sky," I have associated the moon and the sky into a greater whole.

THE ORGANIZATION OF OUR ASSOCIATIONS

In order to be of value to us, our mental associations must not only be extensive, but classified and related as well. Some people's minds are like some people's desks. There is a great deal in them, but it might just as well not be there, for no one can find it in the disorder.

Our scientific theories and their unifying philosophy are our mental filing system. The trained mind has its associations arranged and classified according to their importance, trivial and casual relations being subordinated to fundamental laws and principles. A very important service of education is this organization of associations.

Our systems of thought should not, however, be regarded as fixed and unchanging. It is the mark of intellectual youth and vigor to be willing to change even one's basic principles, if convincing evidence is brought forward to prove that they are unsound. Conversely, the condition of being unconvinced in spite

of valid arguments is the sure index of intellectual senility.

Thus, the mind has two kinds of work to do: (a) to gather facts and classify them; (b) to improve its scheme of classification by emendations and additions.

Exercises

1. What mistake in kinds of association does the pupil make who memorizes his geometry without understanding it?
2. Are odor memories useful and practical? Illustrate.
3. What association is found in seeing a mansion half a mile away?
4. The odor of petunias reminds John of his childhood home. Explain the association.
5. Show how and what the architect associates when he plans a house.
6. Take a lesson in geography and show what associations must be made.
7. What state of mind does this famous adage show? "I'm open to conviction, but I'd like to see any one who could convince me."

(B). The Motives and Feelings

CHAPTER XI

MAN AS A REACTING ORGANISM

MAN responds, or reacts, to stimuli. This is perhaps the simplest and most fundamental attribute of his nature. In place of *man* in the first sentence, we may with equal propriety and truth put *mind* or *consciousness*. Hence responsiveness to stimuli lies at the base of all mentality.

The door opens in the rear of the schoolroom. Every single pupil has an impulse to turn his face to the door, and all who do not inhibit the impulse do so turn. Put a slice of lemon in your mouth. Instantly the salivary glands secrete saliva. *Think* of tasting lemon, and much the same reaction takes place. Here we have three examples of a stimulus and a mental reaction.

THE DIFFERENT KINDS OF STIMULI

A stimulus may be —

(a) *Foreign*, when caused by something foreign to the organism, as the prick of a pin.

(b) *Organic*, when produced by the organism itself, as hunger. For the human organism is auto-stimulating, and is not forced to rely on the push and pull of the external world to set it to working.

Stimuli may also be divided into —

(a) *External*, or physical, stimuli which are produced by the excitation of sensory nerve endings, as the contact with the sting of a bee or the taste of lemon in the example on the preceding page.

(b) *Mental* stimuli, usually called *suggestions*, which consist in the presence of ideas with motor valency in the field of consciousness. Thus, military leaders try to inflame their troops to valorous deeds, as did Napoleon at the Pyramids, by filling their minds with images of honor, glory, and riches to be won with victory. Thus, thinking of a lemon has almost as great an effect on the salivary glands as the actual presence of the lemon in the mouth.

IMPULSE DEFINED

The mind responds to stimuli, but it does not respond in the same way to every stimulus. The mind replies in a different and definite way to every different stimulus. We have a complex system of responses, very delicately and definitely organized.

Let us call the mental response to a stimulus an *impulse*. We may define it thus: *An impulse or mental reaction is a tension or pressure in consciousness towards some definite activity.*

We say a *pressure* towards an activity, and we do not call the act itself an impulse, because it happens that the reaction sometimes remains simply mental, a tendency, and never becomes an external action. This is because the mind has the power of *inhibition*. This power is not found in the lower reaches of the mind. We cannot inhibit at will any of the organic

functions, except breathing, and the reflex actions are only very imperfectly subject to inhibition. The lower animals, and every human being in infancy, and even later when in the subconscious state, react with the fatal precision of mechanisms. But in its higher forms, the mind has the power of delaying and even of refusing the reaction. We shall hear more of inhibition later.

Desires. — With experience and deliberation a purpose, a "final end," becomes explicit in consciousness. This develops, magnifies, and transforms the impulse. *A desire is a pressure or tension in the mind toward realizing a purpose.* In the case of a desire, the impulse reaches out for the *result* of the activity, not for the activity itself. When the boy climbs upon a chair in the pantry cupboard, preparatory to the acquirement of a pumpkin pie, the impulse, the inner pressure, is towards the enjoyment of pie eating, which is the purpose of his actions, and there is no direct impulse to climb on a chair. A desire, then, is a mental pressure purpose-ward. Desires are entirely independent of the will, and are neither diminished nor increased by the direct command of the will. The measure of the strength of a desire is the intensity of feeling with which it is indissolubly connected.

The stimulus in the case of a desire is an imagined future good either for one's self or for some one else. In the example given, the stimulus is the imagined bliss of future pie eating, which quickens the impulse to invade the cupboard.

Instincts. — A great many of our actions, however, are done without any reference to results or future

effects. We simply *feel like* acting in a certain way, and this is all the explanation we can give. For example, a few years earlier, that boy we just spoke of put anything and everything he could move into his mouth. He had no idea that by so doing he could or would increase his happiness. He simply felt like doing it, and did it. Here the stimulus seems to be the mere sight or touch of an object.

Examples of *instinct* are laughing, smiling, and weeping. When done with a purpose in view, these expressions of feeling are not genuine. A person when "killing time" will walk, whistle, and whittle, just because he feels like doing something.

The lower animals have more numerous, and more complex, instincts than man. The honeybee constructs cells that are mathematically perfect for economy and strength, and still we feel sure the bee never studied geometry; the squirrel gathers and stores nuts in the fall for his winter food, but we don't imagine he keeps an almanac; in fact, we know he does not, for he will do the same thing whether he has ever associated with other squirrels or not, and even when the practice is perfectly useless.

An impulse, then, is a conscious pressure towards some specific activity. Experience develops these impulses into desires, that is, impulses with a conscious purpose, and usually we think of this purpose as the original propelling force in the impulse. This, however, is false. All our impulses were at first blind, or instinctive, and many remain such throughout life, at least may reappear thus on occasion.

The impulse is always accompanied by a feeling,

and the intensity of the feeling is a measure of the strength of the impulse. When the purpose of the impulse is not present in consciousness, we may speak of it as a blind impulse, or instinct. When the impulse is not native to the individual but acquired, it is a *habit*.

Instinct and Desire Differentiated. — The stimulus which awakens a desire is always the image of something thought attainable in the future. The motive force lies in the desirability of this future goal. But here it must be noted that the happiness of another person may be directly desirable, and not simply indirectly desirable as increasing one's own happiness.

In blind impulse the stimulus is something immediate, a sensation or an "idea." Our minds are so constructed that without reflection and without purpose they tend to respond to certain stimuli in certain definite ways. Thus if a person is insulted, he will have an impulse to strike before he has had time to formulate a purpose, and before he has pondered on the consequences. A hungry person has an impulse to eat without any thought of the purpose of eating. The mother kisses the child, not because she has figured out that this is a fine way of getting enjoyment, but because there is something in her that impels her to do this without any aid of philosophy.

The Subconscious Reactions (or Impulses). — (a) *Reflex actions*. An incoming neural current may be subconsciously switched in a nerve center into an outgoing motor neural current. This is *reflex action*. Sneezing, winking, coughing, grasping for support when falling, are examples. The stimulus is a "sensory"

neural current. We have classed it under the subconscious, though we may be clearly, even painfully, conscious of our reflex actions. But clear consciousness is in no way an aid to reflex actions; hence it best fits into the subconscious class.

(b) *Organic functions.* Our minds "run" our bodies, but we waste very little consciousness on that business. Still even our deepest subconsciousness partakes of all the essential characteristics of mind, consciousness. The bodily organs respond to stimulation not only of the physical kind, but also that of suggestion. Mental excitement makes the heart beat faster, and a disgusting thought "turns the stomach."

GRADATION OF MOTIVES

The direct response of the mind to a stimulus we have called *impulse*. But man has evolved beyond the necessity of a direct and unvarying reaction to stimuli. He can inhibit his impulse deliberately and choose among several possible lines of action. Such chosen motives we have here called *ideals* or *rational interests*.

We may then grade or classify motives according to their evolution as follows:—

- I. *Ideals, or rational interests.*—These are chosen purposes and have motive power independent of emotions.
- II. *Impulses or emotional interests.*—These occur without our choice, and cease to exist when the accompanying emotion dies.
 1. *Desires.*—Impulses (direct mental reactions) with a conscious purpose.
 2. *Instincts.*—Impulses without a conscious purpose.
 3. *Subconscious impulses,* or mental reactions.

- (a) *Reflex actions*, as shutting one's eyes when an object comes near them.
- (b) *Organic functions*, as the beating of the heart.

Exercises

1. Define and describe *stimulus*, *reaction*, *suggestion*, *impulse*, *desire*, *instinct*, *expression*, and *inhibition*.
2. Give examples of physical reaction.
3. Give examples of instincts in human beings.
4. Give examples of instincts in animals.
5. Try to improve upon the classification of stimuli.
6. Try to improve upon the classification of reactions, or impulses.
7. Place the following reactions in the scale, or classification from *desire* to *organic function*.

Some one trails a string over the upper lip of a sleeping person. The sleeper, without awakening, brushes his lip with his hand. Where would you place the act of the sleeper? Where the act of the joker?

John grasps inadvertently a heated poker, intending to stir the fire. He drops the poker quicker than he grasped it. What kind of impulse impelled him to the first act? To the dropping of the poker?

CHAPTER XII

FEELINGS, IMPULSES, AND THEIR EXPRESSION

MAN appreciates, puts a value on, his experience. He is pleased or displeased with his contact with the world. This aspect of pain or pleasure in our mental life is called *feeling*.

Note carefully that feeling is not a separate psychic reality, a distinct mental event, but that it is an element, an aspect, of every mental state. It is the pleasure or pain of *any* state of consciousness.

THE RELATION OF FEELING TO IMPULSE

Feeling and impulse are intimately united. Every feeling is accompanied by an impulse, and there are no impulses without feelings. In fact, feeling and impulse are two sides of the same psychic reality. In everyday thinking we seldom discriminate between the two. Thus *hunger* is at once the name both of the painful feeling of an aching void and the impulse to fill this vacuum; and fear denotes both the constricting, crushing, painful sense of danger and the impulse to flee.

The popular conception is that the feeling is the cause of the impulse. We usually think that we have an impulse to run away because we are afraid. Some

psychologists, and among them William James, maintain the exact opposite, viz., that we feel afraid because we run away and we feel angry because we strike.

Neither of these views can be maintained, if we strictly adhere to our definitions, and are careful in our analysis. Feeling and impulse are aspects of the same psychic event, and both are occasioned by a common stimulus. In the case of fear, it is the *idea* of impending danger that is the stimulus both of the feeling and the impulse of fear.

Feelings and impulses are, then, indissolubly united. Wherever fear as an impulse is present, there is also fear as a feeling, and the strength of the impulse is exactly the same as the intensity of the feeling. Every impulse has its peculiar feeling attached to it, and the impulse is born a twin with the feeling and expires at the same moment with its twin brother. But notice that they are twin brothers, not father and son. The feeling is neither the cause nor the effect of the impulse any more than this page is the cause or the result of the page on the other side of the paper.

The Universal Motive. — It is the province of philosophy to unify all things. A prominent class of philosophers and psychologists of all ages have found the universal motive for human action in a *desire for happiness*. Usually it has been put in the absolutely selfish form of a desire for *one's own* happiness only. Every impulse, it is argued, is a fleeing from pain and a seeking of pleasure. The mind, they say, always seeks the line of least resistance, and we act hence in the way that promises a minimum of suffering and a maximum of enjoyment.

The trouble with this hypothesis is that experience shows it *isn't so*. Our motives are not originally united into one grand aim in life. We have, on the contrary, many discrete desires for various concrete experiences and activities. The boy does not desire joy, he wants to go fishing. James does not long for love's bliss, he longs for Sally; and he does not long for Sally because he has figured out that Sally means happiness to him. The munching schoolgirl is not pursuing happiness, her soul is set on caramels. We are not under the domination of one all-inclusive desire for happiness and we do not, consequently, sit down coolly and rationally and choose from the means at our command the ones that will lead to the desired result — happiness — as the angler critically selects from a number of flies in his box that fly which he thinks most likely to catch the fish. No, our yearnings and impulses are directly connected with something concrete to be obtained, attained, or done, and in our less developed state we care not whether it increases the sum total of our life's happiness or not. Thus the boy goes in swimming though he knows he will be spanked for it, and the drunkard drains the glass though he knows the ultimate result is only woe.

The point we wish to make here is that we have many and diverse desires and impulses, and that though these doubtless could be reduced to a system and unity by a philosopher, the average human being is emphatically not conscious of any unifying connection binding all his emotions and impulses into one. Very often, the best reason we can give for an action is, "I felt like doing that." We are so constituted that there is in us

a pressure or tension in consciousness to act in certain ways. This conscious propulsion to action we here call *impulse* or *emotional interest* and it is aroused by stimulus. There is not *one* impulse, *one* motive, *one* reaction to stimulus, but there is a specific reaction for each stimulus. Thus, when hungry, we have a lively interest in food; when angered, an impulse to strike; when a sound occurs behind us, an impulse to turn the head; when reading a mystery story, an emotional interest in continuing reading to find out how it "turned out."

The feeling that forms a part of the psychic event that contains the impulse is either painful or pleasant. If painful, this feeling is accompanied by a secondary impulse to rid one's self of this pain; if pleasant, to seek to increase this pleasure. But note that this secondary impulse is not the primary impulse, and is usually much weaker. Thus the lovesick swain enjoys many a weary hour by daydreaming of "her," but he does not think of her because it is *pleasant* to think of her, but because he loves her. This is proven by the fact that if he lose her, or grow jealous, so that his thoughts of her become painful to him, he does not by any means cease to think of her. His impulse to think of her is directly bound up with his love of her, and this impulse he has whether the exercise of it brings him pain or pleasure.

The angry child hits his adversary because the internal pressure to hit is too strong for any inhibiting force present to hinder. To be sure, the pent-up feeling accompanying anger is disagreeable and the relief experienced when the child gives way to the pressure to strike, is very pleasant, but it was not to get rid of

the disagreeable feeling and to get pleasure that the child struck. The child was not thinking of itself and its condition at all. It never speculated on the psychological effect of the blow on itself. It simply felt it *had to strike*, and it struck.

A child is in danger of drowning. The mother jumps into the water and with imminent peril to herself saves her child. When the child fell into the water, the mother had at once a strong impulse, a tension, a pressure, a mental pushing towards jumping in at any risk to save her child. This impulse was accompanied by a most poignantly painful feeling of terror at the thought of possibly losing the child. But it was not to escape this pain that the mother saved the child.

Yet another example and analysis of impulse and emotion may be of value. Let us analyze fear. Fear consists of an *impulse to flee* from what is conceived as danger, and a disagreeable *emotion* so intimately associated with the impulse that most psychologists have talked now of the emotion and now of the impulse without distinction. The mischief of the blunder is the accompanying tacit assumption that the disagreeable feeling is the motive power of the impulse to flight; that hence the measure of the disagreeableness of the emotion is the measure of the force of the impulse to flee, that a person wants to flee because it pains him to be afraid. This is fundamentally false. The emotion and the impulse are two aspects of the same psychological event. We are so constituted that we want to flee when in presence of danger. We also feel pain in the presence of danger, and we feel worse if our desire for flight cannot be gratified. But we do not primarily

want to flee because fear is painful. In fact, when very much afraid we pay no attention at all to our sufferings from fear. Our whole mind is occupied with the thought of the danger confronting us.

Thus we may conclude that we are impelled by primary forces, for the existence of which we can find in consciousness nothing ulterior, to certain definite actions, and the aversion to pain and desire for pleasure constitute only one of these impelling forces.

COMMON CHARACTERISTICS OF EMOTIONS AND IMPULSES

All emotions and impulses are in themselves good; they become evil only when developed out of proportion and when we lose control of ourselves.

All emotions and impulses are short-lived. An emotion and impulse that continues above the threshold of consciousness for several hours is a menacing psychological phenomenon. It is certainly debilitating, and there is probably danger of insanity. "But certainly the grief for a dead friend lasts more than a few hours." Yes, but how? In a few hours does not sleep put an end for a time to the sorrow? If the sorrow is so great that sleep is impossible, there is indeed great danger. And even in waking moments, there will soon come times when, at least for a little while, the weight of grief lifts from the "heart" of the bereaved one.

During its short life, the emotion is constantly varying in intensity. Very great intensity is not maintained for more than a few seconds at a time.

Consequently impulses and emotions are equally variable, equally short-lived. They are also liable to

frequent resurrections. Actions caused by impulse are therefore "jerky," intermittent, never carried on consistently and uninterruptedly for any great length of time, though this does not hinder them from having a most frequent recurrence.

EXPRESSION OF IMPULSES AND EMOTIONS

We cannot control or even influence our impulses and feelings directly. We cannot help having them. No one can say successfully, "There now, I shall no longer be afraid of the dark; I shall no longer like mince pie." Our emotions are totally independent of our will.

Every emotion has some bodily expression. Thus in fear there are pallor and trembling, and, if the impulse triumphs, the motions of flight. The emotions, the impulse, and the expressions are intimately connected and interdependent. Impulses and emotions can be starved to death, yes, in some cases choked down almost instantly, by refusing them expression. Giving free and vigorous expression to a slight impulse and emotion fans it into a violent flame. Thus when the child slightly afraid of the dark begins to run, its fears increase and it is seized by an uncontrollable terror. A retreat in war invariably tends to become a panicky flight and requires more skillful handling by the officers than a storming. In the sullen crowd that surrounds the prisoner, there is not one person that really intends to lynch him. But some one cries, "Lynch him," and dangles a rope before the crowd. Here is expression for the slumbering passions. The prisoner is seized, dragged to a tree, the rope is adjusted, the deed is done.

The impulse to wreak vengeance on the prisoner grew with each detail in the performance, and very likely not a man there, not even the one who first cried, "Lynch him," could have otherwise brought himself to take the prisoner's life.

How to inhibit the Expression of an Emotion.— Suppressing the expression suppresses emotion and impulse. This is done by shifting the attention to another subject. The same soldiers that will change a retreat to a terror-stricken flight, as the Federals at Manassas, will charge with absolute fearlessness in the face of certain death, as at Cold Harbor. Why? Keeping the attention on the activities involved in charging, they do not give any expression to the incipient impulse and emotion of fear. Hence fear is choked out; and giving the strongest possible expression to the combative impulse and the emotion of courage, raises this emotion and this impulse to a state of ferocious frenzy which excludes every other thought and interest from consciousness. We may hence state the law as follows:—

Emotions and impulses and their expressions are interdependent. The suppression of the expression will at once decrease and finally annihilate the impulse and the emotion.

We cannot by a mere fiat of the will obliterate an impulse or kill an emotion, but by this indirect method we may become masters of our emotional and impulsive nature. An ungovernable temper in a middle-aged person shows that he has not disciplined himself by practicing self-restraint in his youth. One of the finest products of human endeavor is the type of char-

acter we call "well-bred," and the charm of such a character lies in the perfect control of appetite, passions, desires, and temper. We do well in admiring the ease and suavity of such a person, his uniform courtesy and imperturbable self-possession in danger and in irritation, for they represent years of patient and exacting training in self-control.

Hence emotions and impulses depend for their life and growth on expression. Sobbing and weeping feed our sorrow, and laughter keeps up our hilarity. The person who never restrains his anger, but rages and swears to his heart's content, is sure to develop an uncommonly "hot temper." If when walking a high railroad bridge you do not check the first tremor of dizziness by knitting your muscles and taking firm, steady strides, you will soon be overcome by dizziness.

To be sure, some people enjoy having a good cry; and the bitterness of grief is assuaged by tears; but this in no way contradicts our theory. It is always painful to inhibit a strong emotion or impulse. Therefore, though the feeling of sadness is as great or greater than ever, we experience a great relief in allowing our feelings their natural expression. Let it also be noted that our emotions exhaust themselves in the expression. After having "had her cry out," the girl feels better. The fellow who "flies off the handle," and roars and curses, is shamefaced and subdued after the brain storm is over.

There are, then, two ways of getting rid of an emotion or impulse. First: Inhibit all expression, and it will die of starvation. Second: Give it full sway, and it will burn itself out. But the burning-out process

is dangerous — wildfire always is — and deceptive, since every time we give way to an emotion, we come deeper into its clutches for the next attack.

Now I expect this objection: Inhibited grief and anger do not die out. Have you not heard of “nursing one’s anger”?

Precisely. When anger or grief is *nursed*, the expression is not fully inhibited. In grief the chest is depressed, the eyes cast down, the breath short, and sometimes there are convulsive sobs and moist eyes. In anger, your man who thinks he inhibits his emotion, grits his teeth, wrinkles up his brow, doubles up his fist, and allows bitter thoughts to infest his mind. This is not inhibition. In fact, perfect inhibition may be impossible, but this is always possible, and is given as a sure cure: Inhibit every bodily expression under the control of the will by doing something else, and keep your mind off the subject by thinking of something else.

Here is where the iron law of habit again asserts itself. Every time we give way to an appetite or a passion, every time we give expression to an emotion or an impulse, we make it easier to repeat and harder to resist.

Perhaps some persons do inhabit systems whose tastes, appetites, passions, and impulses are diseased from birth. But such cases are certainly rare. With most of us it is true that *per se* our impulses and emotions are neither right nor wrong, but simply natural.

System of True and Just Proportion. — Our training in habit should be such as to reduce and expand the emotions and impulses into a harmonious system, and

to subordinate the lower motives of our nature to those of the higher. Thus, we ought to like our food, and enjoy our meals, but any abandonment of our whole being to the pleasures of the table is gluttony or greediness, and degrades us. No one needs to be told that slavery under the appetite of perverted thirst is one of man's greatest curses.

Value of Self-control. — This is the highest of the impulse virtues. No emotion or impulse should be allowed to grow so strong that its owner is not its master.

In the vernacular we say that a person is *mad* when he is so angry that he will say and do things that he would not do after deliberation. That expression is not elegant but it is scientifically correct. When anger is not under self-control it is really temporary insanity, madness.

Every impulse and emotion is dangerous when beyond control. Hence self-control is of greatest importance.

The pedagogy of emotions and impulses is, then, exceedingly simple: —

Give all expression possible to every emotion and impulse you wish to develop; inhibit every expression of every emotion and impulse when it transcends its proper limit.

Continue this line of treatment until it crystallizes into a habit.

But since self-control is a habit, it can be acquired only gradually. Hence we should not expect children to be perfect in this art. How much of it we can expect in children depends on their previous training and degree of mental development.

It is therefore absurd of teachers to try by threats to keep children from turning their heads around when a noise, as of some one coming in late, occurs behind them. To inhibit this neck twisting requires a certain amount of self-control. If the pupils have it, well and good. They will not turn around. If they have it not, a threat to behead them will not stop their neck muscles from turning their heads.

This should be the aim of the teacher: so to train his pupils that when they arrive at maturity they may have perfect control of themselves.

Keep your pupils ever pressing forward to new conquests in self-control. Give your approbation for every victory and your pity, not unmixed with contempt, for every defeat in this struggle to learn the art of self-control. But don't let your approbations and criticisms be voluble. Be chary with words. A look, a smile, a frown from a teacher that says little and means much, is far more potent than scoldings and sermons.

Remember that this side of morality is an art, a habit, and that no art, no habit, is ever learned by talking about it, but by doing.

Above all, see that you yourself have the self-control you wish to teach your pupils.

Exercises

1. Review this chapter by summing up each paragraph in a line or two.
2. Distinguish the feeling and the impulse in each of the following: —

On St. Valentine's day, May runs to meet the postman in the street, grabs delighted a big envelope, only to find it is addressed to her sister. She brings the valentine to her sister. They

open it together, and find it is, contrary to their expectation, an ugly one.

At each step, what is the impulse and what is the feeling of each girl?

3. State all the principles you know for the training of the impulses and emotions. Make the statements as terse as possible and try to improve upon the statements of the book.

4. Isn't it true that having "a good cry" relieves the blues? Try to reconcile this with the law stated in this chapter that the way to get rid of an undesirable emotion is to inhibit its expression.

5. Why is revenge always wrong?

6. Arrange the chief emotions and impulses in a list, beginning with the highest and most spiritual and ending with the lowest or animal impulses and emotions.

7. Illustrate by an example from your own experience the danger of doing anything to express one's feelings when in a "fit of anger."

8. Illustrate the value of self-control by an example from history.

CHAPTER XIII

FEELINGS AND IMPULSES CLASSIFIED

ALTHOUGH it is impossible to reduce all impulses to one impulse in that the individual is conscious of any such unity, still our impulses and emotions form a logical whole, and we may infer that in the Universal Mind all striving and feeling are working as an harmonious whole.

The following classification of feelings and impulses is submitted :—

CLASSIFICATION OF FEELINGS AND IMPULSES

- I. BODILY FEELINGS AND ATTENDANT IMPULSES.
 1. *Appetites.*
 2. *Organic Feelings and Impulses.*
- II. EMOTIONS AND MOTIVES OF SELF-PRESERVATION.
 1. *Fear* and the instinct and desire to *hide* or *flee* from danger ; *courage*, *defiance*, and the instinct and desire to *defend*. These two are primary and fundamental. Love of adventure is evolved from these.
 2. *Anger*, *hate*, *jealousy*, *pugnacity*, and the like are expressions of self-preservation in the personal environment.
- III. EMOTIONS AND MOTIVES OF SELF-EXPANSION, OR PROGRESSIVE SELF-REALIZATION.
 1. *Motor* emotions and interests. The desire for motor expression of one's self, by —
 - (a) destroying,
 - (b) owning,
 - (c) constructing, etc.

2. The *intellectual* emotion and interest. The desire to realize one's self ideally, to expand the self to include as much as possible of the intellectual realm. (This is "interest" in its usual pedagogical meaning.) Curiosity, wonder, the joy of discovery, scientific interest.
3. The *æsthetic* emotion and interest. The desire to realize the ideal. The love of beauty and the interest in producing it.
4. *Social* emotions and motives¹ (desires, interests, impulses, instincts), such as —
 - (a) Love, sympathy, gregariousness, imitation, emulation, pride, shame, love of praise, honor, glory.
 - (b) Pity, contempt, the patronizing feeling, desire to protect, lead, rule, teach, etc. (felt towards inferiors).
 - (c) Respect, reverence, trust, loyalty, desire to follow, obey, submit, believe on authority, etc. (felt towards superiors).
5. *Moral* emotions and motives. These are the social emotions and motives universalized. Love for and devotion to —
 - (a) Purity, (b) honesty, (c) truth, (d) justice.
6. *Religious* emotions and motives. The instincts, desires, and emotions connected with our communion with the Supreme Being: awe, reverence, devotion, trust, faith, submission, the instinct and desire for worship. Strictly speaking, these are exalted social emotions and motives.

DISCUSSION OF CLASSIFICATION

Bodily Feelings. — Class I is usually denominated "physical" feelings. But there is some objection to

¹ We may also divide social emotions and motives into —

(a) *Self-centered*: as, pride, shame, vanity, haughtiness, humility, desire for and joy in teaching, leading, in praise, honor.

(b) *Society-centered*: as, love, sympathy, pity, contempt, respect, reverence, imitation, gregariousness, patriotism, loyalty, desire for and joy in discipleship, obedience.

this term, as of course every feeling must be mental. In this class are included those feelings which consciousness locates in the body.

The name *organic* given to the second group under this class only remotely connotes the meaning, but a better name was not found. It is simply a name for all that is left of "physical" or "bodily" feelings and motives, after the appetites are subtracted.

Every emotion has, at least when strong, attendant bodily feelings. Thus, when one is afraid, cold shivers run down one's back; when angry, one's face may burn. But that these mere accompaniments are not the real emotion is readily seen when we note that it is quite possible to have cold shivers without being afraid, and a burning skin without being angry; and besides, that it is never this little byplay of bodily feelings that bothers us when we suffer from strong emotions.

Emotions of Self-realization. — *Self-realization* may be said to be the end of all our activity, and hence the object of all motives and the subject of all emotions. Self-realization is not selfishness, is not merely the development of our own individual self, but the development in us and through us of the Universal Self. This subject (the self) will be discussed further in a later chapter.

Our interest in self-realization divides naturally into two parts, above and below zero, so to speak. We are interested in keeping what we have (self-preservation) and in getting more (progressive self-realization, self-expansion).

Actions of self-preservation are primary and fundamental. They are biologically the oldest of all the

motor reactions. To preserve ourselves and ours from diminution and destruction is our first duty.

When we are in the presence of danger, two alternatives present themselves: escape or defense. *Fear* or *courage* is aroused. *Anger* is often the name given to the fighting emotion, but anger is a complex emotion and motive, and consists not merely of the motive of defense. We use the word *courage* ordinarily to denote an attribute rather than our emotion or impulse, but the emotion and motive corresponding to courage is what we here mean by courage.

Love of adventure is a development from the impulse to defend. For the progress of the race it is necessary that some — that many — individuals risk life and limb in the conquest of nature and the battle against enemies. Hence the love of tempting danger is a very prominent impulse in man, especially in youth. Seldom was valuable work for humanity delayed because of lack of daring among men.

Motor Emotions and Interests. — Man is interested in making himself felt, in realizing himself in the physical world, in extending the sphere of influence and control of his visible self. The child and the savage especially, but even the most advanced of men, enjoy making their own power felt by *destroying*. The child tears the newspaper, the boy smashes windows, the man hunts, not simply because he wishes to destroy, but because the joy of annihilating forms a considerable element in the mixture.

Still stronger is the *constructive* interest. We enjoy *making* things. What boy has not littered up his father's workshop, trying to make ships, guns, steam

engines, crossbows? Every true workman finds perennial joy in the constructive side of his craft. The constructive interest forms an indispensable factor in the motor power which keeps the wheels of industry turning.

Another strong impulse is the impulse *to own*. The property interest lies at the very basis of the social structure. Again let us beware of philosophical generalization. We do not desire property simply because we wish to enjoy the use of it. When your father said, "You may use this gun, but I do not give it to you," it did not please you half so much as if he had given you the gun to be your very own. Many a farmer's lad has extracted tons of bliss from the possession of a colt, though he could not do a thing more, or profit a cent more, with "his" colt than with any other colt in the stable. But it was *his* colt, and there was sweet enjoyment therein.

The Intellectual Emotion and Impulse, the Desire for Knowledge. — We do not desire knowledge primarily because knowledge is useful and may be a means of happiness, but we simply desire knowledge. That is as far as we can go back of the returns. There are good biological reasons for this desire in the history of our evolution, but of these we are not conscious; we simply *want to know*. The lower form of this impulse when concerned with trivial affairs is called curiosity. The higher may be called scientific interest. This interest is the mainspring of the scholar's activity. This is mainly responsible for newspapers, gossip, scientific research, polar expeditions, astronomy, and the major number of sentences that fall from human lips. Other

interests, mainly social, are inextricably mixed with the scientific interest, but in a very great section of human activity it is the main source of power.

The Æsthetic Interest, or Impulse, is the fundamental efficient cause for the fine arts, literature, taste and refinement in dress, dwellings, and surroundings. Philosophically we may say that the object of this impulse is *harmony* and that it is our fundamental feeling of an impulse from the great Oneness of the universe; but it is important to bear in mind the fact that we have no immediate intuition of these philosophic doctrines. We just feel a rapture when in the presence of certain sights, sounds, and thoughts, and are impelled to seek, to produce, and to enjoy certain objects, which we call beautiful.

Social Emotions. — Under the subdivision *social* we meet with a perfect welter of emotions and motives. They are so numerous and so important that any treatment would be fragmentary. Man is more than an individual. He belongs to his fellow men and with them forms a unity. Love, sympathy, fellow feeling, kindness, are names applied to this great main stream of emotions and interests that express the unity of all persons. Closely allied to these are the social impulses in the narrower sense, — gregariousness, imitation, sociability.

It may be noticed that every social emotion and impulse has its *negative*. Thus, love has hate as its negative, and the impulse to obey has the impulse to refuse obedience. The negative is of course justified only when there is something false in the environment which should be removed.

Every social emotion and impulse has also a *complementary* emotion and impulse. Thus, love of others is complemented by love of self, imitation by the impulse to be original, and the impulse to obey by the impulse to command. Thus, while fashion rules with a rod of iron, few women would like to copy exactly the dress of another. One of the fine problems of character is to find just the right proportions of complementary impulses.

It will be asked, "How can such purely selfish emotions as pride, vanity, and shame be called social emotions. In fact, is not the expression 'self-centered social emotions and motives' a contradiction in terms?"

Pride, vanity, and all the other self-centered ("selfish") emotions and motives are here classed as social because they can find expression only in society. A Robinson Crusoe, living alone, could feel proud or humble only when in communion with God or other spiritual persons, or when in memory he lives in imaginary society. That is why it hurts us to associate with an arrogant person. His undue aggrandizement of himself is a social affair. Mentally he abases us by just as much as he elevates himself. Selfishness is a social vice. All egoistic emotions are necessarily social.

The Moral Interests. — Morality is not merely a matter of impulse, interest, and emotion, but it is partly this. The moral emotions and interests are the social ones universalized. He who refrains from stealing his friend's property but who is not averse to filching the stranger's, is moved by social, not moral, impulses. But he who feels like treating the stranger's

property rights as scrupulously as his own has the moral emotion and motive (impulse) of honesty.

Religious Emotions and Interests. — The emotions classified as *religious* are in a way a combination or adaptation of other objective emotions. In this group we find emotions similar to the social emotions which we call reverence and the desire to obey, but here they are stronger and directed toward the Supreme Being.

Love and devotion to purity, honesty, truth, and justice, when called forth by the conception of a divine mind as a standard of these qualities, are religious emotions.

The æsthetic emotions — love of beauty and of harmony — play a part in religious feeling.

The intellectual interest, the desire for knowledge, when directed toward the mysteries of the universe, becomes wonder or awe.

Exercises

1. Try to improve on the classification of impulses and feelings given in this chapter.

2. Give an example of each feeling and impulse mentioned in the classification.

3. How can the same person at the same time have both the desire to lead and to follow?

4. Pocahontas warned the English because they were her friends. Was the motive social or moral?

5. A person abstains from doing wrong because he fears punishment after death. Where would you class his motive?

6. Why are the windowpanes nearly always broken in vacant buildings in secluded places?

7. What emotion rightly belongs to the singing of a hymn?

8. Mrs. A and Mrs. B, fierce social rivals, had both ordered expensive gowns of their respective dressmakers. An unlucky

fate ordained that the two gowns were precisely alike. Mrs. A got hers first. When a little later Mrs. B got her gown, she was heartbroken to find it was just like Mrs. A's, and she convinced herself that Mrs. A had in some way stolen the design from Mrs. B's dressmaker. So to get her revenge Mrs. B gave her gown to her cook, on condition that she should dress in the gown next Sunday and take a prominent place in church where Mrs. A could not fail to notice her. Name the feelings involved.

9. What emotions and impulses were involved in the motives that led Benedict Arnold to become a traitor?

10. To what emotions does Dickens prefer to appeal?

11. Do you enjoy reading a pathetic story? If not, why do you read such literature? How would you classify this emotion?

CHAPTER XIV

THE CONTROL AND DEVELOPMENT OF CERTAIN IMPULSES AND EMOTIONS

WHILE all of our emotions and impulses can be in a measure controlled and developed, there are certain emotional states which deserve especial discussion because their control or development is a matter of vital importance.

THE EMOTIONS OF SELF-PRESERVATION

Biologically the impulses of self-preservation are fundamental in our being. Without these the race could not have perdured.

In the presence of danger there are two courses of action possible; the first, logically and historically, is escape by hiding or flight. The impulse and emotion that prompts to flight is *fear*. This is the over-shadowing impulse of childhood and of primitive man and is found even in the strongest and bravest. No boast is vainer and falser than that one "has known no fear."

The other course of action in the presence of danger is defense. The emotion that has evolved from the primitive impulse to defend oneself and one's own, though in some respects *courage*, *pugnacity*, or the *fighting impulse* expresses it better, may be called *anger*. Self-defense does not mean only defense of one's life,

one's mere existence. It means also the defense and protection of all that is one's own: family, friends, property, opinions, honor, dignity, plans, and purposes.

Anger as well as fear belongs to every normal character. A milksop who is incapable of just indignation is not an admirable character. But in anger as in fear, the more perfectly all expression of the emotion is suppressed, the nearer to perfection is the character.

The Physiological Effects of Fear are primarily a general depression of the activities of the organism, an incipient, partial, or complete paralysis. The first impulse of fear is to *hide*. The secondary effects are stimulating, for the second impulse of fear is to *flee*. Breathing and the beating of the heart are retarded at first, usually to become much accelerated the next moment. Digestion is retarded, or entirely ceases. The salivary glands cease to function in some cases. Trembling and shivering set in, which means that the neural currents are intermittent; that is, partial paralysis has begun. Pallor, resulting from the contraction of the capillary blood vessels, is one of the universal symptoms.

Many insects suffer complete paralysis when frightened. They curl up their legs and roll from their perch, usually to a place of safety. The fox and the opossum are popularly supposed to sham death when they find flight impossible. It is more likely, however, that such instances are simply cases of paralysis, brought on by fear.

So we may say that nature has arranged that the universal first expression of fear is a *cessation from motion*. No wiser universal prescription could have been

given. The chances of remaining undiscovered are many hundred times better when one is still than when in motion, as we saw when studying vision. Besides, when confronting danger, almost always the safest thing to do is to *stop*. Hence by automatically making movements difficult or impossible in the presence of danger, nature is doing *on the average* the best thing possible for her children.

The Suppression of the Expression of Fear. — But after the first moment of warning, man, especially civilized man, is ill served by these physiological effects of fear. Whether he decides to defend himself, to hide, or to flee, it is of utmost importance to him that his motor system be as far as possible from being paralyzed. When Mr. Lummis was charged by his dog, which was mad with hydrophobia, his life depended on not missing that one shot with the revolver. The reason for accidents is almost always that somebody because of fear loses his presence of mind and his ability to act instantly.

Hence the rule: Suppress with all possible effort every expression of fear in yourself, and never encourage or favor any expressions of fear in your pupils. Raise the chest. Keep the head erect. Whistle. Don't stop and listen if you have no good reason for so doing, but keep right on with your work. In war it is found to be much more difficult to maintain the courage of a defending corps which lies in inactivity behind the breastworks than to inspire defiant courage in the men that charge the same breastworks, though the latter position is much more dangerous.

Fear is nature's alarm clock. As soon as we notice

the alarm ringing, its work is done, and the proper thing is to stop the ringing. In man at least, intelligence should take the place of fear as a means of keeping out of danger after the danger is known.

The Physiological Effects of Anger or Pugnacity. — The physiological expression of anger is the opposite of the primary physiological expression of fear. Anger (pugnacity) is the positive impulse of self-preservation, as fear is the negative, and its expression is in general increased innervation. The heart beats faster, the muscles contract, the face is flushed, the stream of thought is more rapid.

We should discriminate between anger and the fighting instinct and emotion as a whole. Anger in its ordinary meaning is only that peculiarly bitter phase of the emotion which we have when we believe that our adversary from moral turpitude is doing us an injustice.

In ninety-nine cases out of a hundred anger is a mark of narrowness of the mind. If we had been broader minded, we had not become angry. Still, there is such a thing as just indignation. And it has never been possible, in spite of teachers and preachers, to convince the world that the milksop who cannot be aroused to anger is a better character than the spirited man who brooks no insult. So we may as well admit that temper, spirit, the ability to become indignant, angry, "mad" if you please, is an element that should be found in a good character, but for all that its expression should always be suppressed.

Inhibition of the Emotion of Anger. — Always suppress as far as possible every expression of anger. There

will always be enough involuntary expression to save you from being a milksop. Why this suppression? Because, in nine hundred ninety-nine cases out of a thousand, as soon as the passion dies down you will be ashamed of what you did in expressing your anger. Especially, unless compelled by the circumstances of the case, observe the following rules :—

Never punish a child when you are angry.

Never scold, admonish, argue, or say anything at all on the subject of your irritation when angry.

Never make up your mind on anything while angry.

Many devices for overcoming anger are recorded. This story is told of Lincoln — and of a dozen other great men. A partner of his was terribly indignant over some shabby action of a fellow official. “Write him a letter and tell him just what a mean skunk you think he is,” suggested Lincoln. This suggestion was followed with alacrity. In the course of half an hour Lincoln was handed the result, a letter so “hot” that it fairly made the paper crinkle. Lincoln smiled and said, “You certainly flay him properly,” and then put the letter into a pigeonhole. “If you will hand me the letter, Mr. Lincoln, I will mail it,” said the offended man. “Mail it,” said Lincoln; “no indeed! Let it rest in the pigeonhole till to-morrow, then you may feel like revising it.” On the morrow, the offended man took his letter from the pigeonhole, and without a word tore it into shreds and put it into the wastebasket. When our passions are too strong for our wills, such a device as that is a good crutch for weak human nature.

The cure for anger, or for the habit of hot temper, is

to stop the expression. Don't rant, roar, scold, or swear. Don't strike anybody or anything. Don't even double up your fist, wrinkle your brow, or grit your teeth, and with all speed get something else to do. This is warranted to cure the worst temper between the poles.

In the case of a child, don't let it hit the cat or the dog or even a chair or the floor. As soon as it is safe to do so, force the child to stop crying. I never saw a child under ten years of age remain "mad" or sad for ten minutes after his "howl" had been shut off. I have, on the other hand, seen children cry from pure spunk for hours, when allowed to do so. Care should be taken not to attempt to force a child to stop crying when it is hysterical or in a semihysterical condition, for then this is demanding the impossible.

Set the child to doing and thinking of something else. The child that sulks or "flies off the handle" should be set to work immediately. That is why a sound whipping, though a barbarous measure, is not an unscientific way of cooling anger. It gives the delinquent something else to think about.

THE SOCIAL EMOTIONS AND INTERESTS

Of all the emotions and impulses, those which we have termed *social* are perhaps the most important. Upon the proper development of these emotions depends to a great extent the character of an individual.

Imitation.—The impulse of imitation is perhaps the most primitive and fundamental of the social impulses. It is certainly very deep in our nature, and may be described as an evolution of the fundamental

suggestibility of consciousness. It is very strong in the gregarious animals as well as in man.

Imitation is the chief teacher of children up to the age of five years, and remains an important impulse throughout life. Thus, speech is learned entirely by imitation. The child learning to talk will repeat dozens of times every new word it hears, for apparently no other reason than the desire to imitate.

The chief drivewheel of fashion is imitation. Many other social impulses and desires, however, coöperate in the creation of this wonderful institution. Choice of dishes, smoking, drinking of intoxicants, society manners, the chief elements of custom and of social atmosphere, and national characteristics have their basis in imitation.

Balance between Imitation and Individuality. — Opposite to imitation is the desire for individuality. One of the nicest problems for good sense and good taste is to keep the golden mean between these two tendencies. To be oneself a positive, self-balanced, and in the true sense *distinguished* (that is, individualized) personality, and at the same time to be working in harmony with one's age and people, is a truly fine and noble art.

Sympathy. — The matrix of society is sympathy, love, "charity." The great heresy of the psychology of a generation ago was the doctrine that all altruism is a veiled selfishness, that man in reality never seeks anything else than his own individual happiness. This theory is as false as it is sordid. The love of others is as fundamental in us as the love of self. The mother loves and lives for her child fully as much as for her-

self. In fact, it is doubtful if a perfectly selfish person ever existed. Your closefisted miser is generally saving up money for his children. The outcast shares his crust with a pal. The girl and the boy just before adolescence are just about as selfish as ordinary human beings can be, but even they will oftener than not share their joys with a friend. This is all, to be sure, explained as very sophisticated and abstruse selfishness, but the evidence must be greatly distorted to get this result.

The sphere of sympathy is very narrow with the young child. As he grows older his world expands, and if he has a normal development, his sympathies expand with his world. Your selfish man is just a case of arrested development. The child is cruel to the butterfly and the squirrel, because he does not appreciate the suffering he causes.

In this connection it is curious to note how undeveloped is the average man's sympathy with the "finny tribe" and the lower forms of life generally. Men who have every outward appearance of being civilized will calmly jab a hook through the nose of a living frog or living minnow, and trail it through the water as bait during its death agonies; and after catching a fish let this die in torture from lack of oxygen in its drying gills. If an eye is torn from the socket when the fish is released from the hook, even this additional agony does not prompt the fisherman, who seems to have inherited his feelings from the stone age, mercifully to kill the fish. And then the barbarian will run a rod or chain through the delicate, sensitive gills in order to carry home his victim.

Importance of the Education of the Social Emotions and Motives. — Though absolute selfishness is rare or impossible, relative selfishness is the source of most of our woe. Man is a social animal, but not social enough. Hence it becomes the duty of education to strengthen the social tendencies of human nature. The great virtue of the kindergarten is that it teaches children to be social. The ever present lesson which children should be taught in school in every class and every subject is how to live together, and thus to be successful members of a community when they are grown up. Even the games ought to contribute to this end. Games in which the individual plays for his own advantage alone should be discouraged, but those in which he plays for the success of his side, his party, should be encouraged. The child should learn obedience, leadership, and loyalty on the playground.

FATIGUE AND INDUSTRY

Though fatigue and industry are not, properly speaking, emotions, the accompanying impulses are so universal that it seems fitting to discuss them here.

Fatigue, the Impulse to Rest. — The feeling of fatigue (with the impulse to rest) is our system's energy gauge, by which we are informed as to the amount of energy available. But, like other gauges, it may be "set" differently, and it may get out of order.

There are usually three points in a period of exercise (if carried on far enough) at which we have the negative impulse to stop work. The first has been called the "tire point." This is usually reached sooner than the true fatigue point. When our accus-

tomed daily task is done, we feel tired, whether our energy is used up or not. Hence the fact that one is tired is no sign at all that one has done a fair day's work. The lady in the drawing room may have as much strength as the scrub woman on the front steps, but for all that, the former may feel just as tired out after an automobile spin as the latter after ten hours on her knees scrubbing. This is false fatigue, however, in the former's case, and can and should be overcome. Hence *the fact that we feel tired is no evidence that we have used up all the energy we should before we seek rest.*

When the current fund of energy has been exhausted, we have reached the true fatigue point. If we pass this, we begin to draw on our reserve energy. Take as an example a person of sedentary habits walking; soon after he has walked his accustomed quarter of a mile he begins to feel tired. He has a strong impulse to quit walking. But if he persists, he will find that his tired feeling will soon pass away, and he feels as bright as ever. He has his "second wind." After a while he begins to feel tired again. This is the true fatigue point, and he is wise if he heeds nature's warning. But if he does not, this tired feeling too will pass away, and he will feel almost preternaturally light and wiry. This is especially true if he is under some great excitement. The work is now drawing on his reserve strength. Wonderful feats have been performed in this "third wind" period. A friend of mine is a poor speller, but after two o'clock at night she is almost perfect in the difficult art. Many students are troubled with sleepiness the whole evening until bedtime. Then

if they persist in studying, the tired feeling soon passes away, and they are fully awake and capable of their best work. If work is persisted in long enough after the true fatigue point, the worker arrives finally at the point of exhaustion. The manner of arrival thither is different. Normally it is gradual. Weakness steals by degrees upon the worker. But, especially under great excitement, the worker may feel at his best and work with undiminished zest and vigor until suddenly the collapse comes. There is not a single erg of energy left. The machine stops.

It is always more or less detrimental to work past the true fatigue point; and when the exigencies of life demand that it be done, care should be taken to stop as far as possible on the hither side of the point of exhaustion. The results of working up to the point of exhaustion are likely to be very serious. Physical breakdown, nervous prostration, death, may be expected.

The tire point, or false fatigue point, is perhaps of greatest interest to most students, for most of us are prone to stop there in our studies and not work beyond it and get our "second wind." There is a certain mental inertia even in the best of us at times which must be overcome by sheer force of will.

Industry, the Impulse to Work. — While the impulses to anger, fear, pugnacity, and vanity are likely to pass their proper bounds, if not inhibited, there are other impulses which need strengthening so that they may be well-defined habits in later life. One of the most important is the habit of industry, the impulse to work.

Young people easily get into the habit of dawdling. They acquire the habit of "hanging around" without anything particular to do. They neither work nor play, but, in the expressive slang of the day, "just rubber about." The cure for this malady is simple:—

Habituate your pupils to doing with all their might what they do. Interest them so much that there is not one waking moment they can afford to lose. And if you cannot interest them, force them to work anyway, interest or no interest. They should work with the whole soul when they do work, and play with the whole soul when they play.

PERVERTED EMOTIONAL STATES

We have learned in the foregoing that certain emotions and motives and their expressions ought to be cultivated and others ought to be inhibited. Our problem is further complicated by the fact that emotions and motives may be cultivated in different directions, and some of these directions are detrimental and produce abnormal results. We shall now study some of these perverted emotional states.

Sentimentality. — This rather unfortunate word is used to express a certain exuberance of emotions and of expression of emotions, especially emotions of the tender varieties. If certain emotions, like love, kindness, pity, appreciation of the beautiful, of the noble, and the sublime, are good, and if we cannot get too much of them, it is hard to see at first what objection there can be to sentimentality. But it comes to be objectionable in this wise. What the emotions gain in exuberance, in hair-trigger delicate sensitiveness,

they lose in genuineness, in depth. A too florid expression of an emotion evaporates it. Sentimentality emasculates character, and the long-haired man and artistic-tempered girl who go into sublimate raptures over Browning or an old master are almost sure to be peevish and cranky at home, snippish to superiors, and overbearing to inferiors. The teacher who cannot talk about the children in her class except as lambs and angels, and to whom (in public) everything is either "simply perfect" or "perfectly simple" isn't likely to be good for much when real work and self-sacrifice are demanded. *Cultivate deep feelings rather than easily excited ones, and express your feelings only sparingly in words but to the uttermost in deeds.*

Morbidity. — In certain directions our emotions and impulses are easily perverted. We have a desire to dwell in imagination on the grewsome, horrible, and ugly. Children's appetite for ghost stories is an example. Nothing is more dangerous than to satisfy this morbid desire, especially in the early adolescent age. Indulgence in morbid emotions is a great corrosive of character, and often produces insanity.

Even the normal emotions of remorse and grief, when dwelt upon and not kept under control, may degenerate into morbidity and become positively injurious to the mind.

Remorse. — The ethical value of remorse is easily understood. Its purpose is achieved and its work is done, however, as soon as it has prepared deeply enough the soil of the heart for lasting reform. That mind, however, is morbid which dwells habitually on the guilty past. The mind should be trained to look

habitually to the future and to take immediate steps to realize its good resolutions.

Grief. — Grief is detrimental to health, and has no practical value. Still, it would be unwise to advocate that this emotion should be suppressed as completely as possible. Sorrow, especially the sorrow caused by the loss of loved ones, has a mellowing and refining influence on character, removing the garish commonplace, the crude self-centering of the spirit. But here, as in remorse, care should be taken to avoid the habit of living in the past. The past should be a place to visit, never the abode of the soul. *The living present and the ideal future which we have determined to realize should be the dwelling places of the spirit.*

Queer, isn't it, that we love to be miserable? But what else keeps the pathetic in literature? The effect of the pathetic is very much the same as that of grief, only in a smaller degree. Hence it has a softening, sensitizing effect on the soul. But the enjoyment of the pathetic may very easily be overdone. Its effects then become morbid.

THE HYGIENE OF THE EMOTIONS

Emotions cannot live without expression. They can, however, live on almost any kind of expression. But a healthy state of mind can be acquired and maintained only by giving our emotions their proper expression along the lines of useful and normal activity.

Always give your good emotions a practical and useful expression in deeds at the earliest possible opportunity. And don't wait for this opportunity. Make it. As Professor James says: "Let the expression be the

least thing in the world — speaking genially to one's grandmother, or giving up one's seat in a car, if nothing more heroic offers — but let it not fail to take place." This being satisfied with having good emotions without giving them expression is a fearfully prevalent disease in our days, and is facilitated by literature and the drama. In the story and the play we are brought in sympathy with a host of personalities which it is impossible for us to help or harm. We find this a cheap way of enjoying the generous emotions. So we pity, love, and sympathize with the imaginary characters on the stage or in the novel, bask in the generous warmth of our own emotions, pat ourselves on our metaphorical backs for being such sensitive, good-hearted persons — and let the real, unfortunate neighbors of ours suffer without our aid.

The bookworm, the traditional scholar and professor, the artist, the musician, the actor, are characters that are especially liable to this disease. In fact, our complex civilization with its multitude of stimuli and its limitation of avenues of reaction favors everywhere this do-nothing attitude. Modern man tends to become a man of words and vain speculations.

It is then our duty to make special efforts to resist this dry rot of character. Never let a desirable emotion pass away without giving it some active expression. If you cannot save the heroine of the play, make some real, even if trifling, sacrifice for your neighbor. Take an interest in the institutions of civilization around you, churches, charitable societies, social clubs, commercial clubs, social settlements, and what not. Let your interest be unselfish and broad, and

then act on it. Do something for humanity, remembering that "one of the least of these, my brethren" is just as truly humanity as the Son of Man himself.

Men engaged in occupations that do not call for much exercise of the motive side of the soul, as authors, teachers, scientists, and in a lesser degree other professional men, whose motor (will) power is exercised mostly in a routine fashion, should have some secondary occupation which brings their active side into use. A year off now and then spent in politics, exploration, merchandising, or some form of manual labor would tend to keep their souls from drying out, and preserve virility in character.

To maintain virility and vitality of emotions and genuineness and sincerity of character, *always let action follow every good emotion, and let the distance between emotion and action be as short as possible.*

Exercises

1. Give examples from history of each of the emotions discussed in this chapter.

2. Formulate into a terse statement the law of control of emotions, impulses, and desires by their expression.

3. State some peculiarity or practical observation about each of the emotions discussed in this chapter.

4. Add some point of value to the discussion of some topic in this chapter.

5. What can you say in favor of and against building air-castles?

6. John is afraid of the dark. Once, at night, when half a mile from home, he thought he saw something white coming after him. He began to walk a little faster, because he was afraid. How did he end his adventure? Why?

7. Bill didn't mean to have a fight with Tom, and he only

struck Tom's cheek with a spitball "for fun." Tom was not angry, just slightly irritated, so he turned to Bill and said sharply, "Quit that, will you?" Quoth Bill, "I'll quit when I choose to." "Oh! cut that out, or you will be sorry," retorts Tom hotly. Conclude the story, and discuss its psychology.

8. Give some device for encouraging industry in children.

9. What do you think of Poe's stories as literature for school use?

10. At what age are we most likely to be sentimental? Give an example.

CHAPTER XV

CULTURE

THE Hand, the Head, and the Heart! To do, to know, and to appreciate! These, as we have seen, form the triangle of education. He who does something skillfully, knows an *art*; he who knows anything systematically and organically, possesses a *science*; he who feels with developed appreciation is in possession of — what? There is no universally accepted term, but the best candidate for the place seems to be the word *culture*.

The term "the fine arts" is unfortunate in this connection. The fine arts are more than *arts*; they have a *cultural* value as well. The question is not simply about something to be *done*, but also and chiefly about something to be *appreciated*. Our business in æsthetic education is chiefly with this element. Not "Can the pupil *produce* something beautiful?" but "Can the pupil *enjoy* the higher and purer form of beauty?" should be with us the greater question.

THE INNER SIDE OF EXPERIENCE

The inner, or subjective aspect of every mental event is a feeling. The outer, or objective aspect is the thought. Thus, in reading a poem I am thinking the poet's thoughts after him. This is *thinking*, the

objective side of what happens in my mind. But at the same time my soul burns with the emotions evoked by the poem. This is the subjective, or inner side of my experience.

Thought and Feeling Contrasted. — Thoughts are common property. When not led astray by its feelings, every sane mind must get the same conclusion from the same premises, if it thinks at all. The philosopher will say that it is not I, but Universal Man that thinks in and through me when I say that $2 \times 2 = 4$. We do not *make* truth, we simply *discover* it; it is not our individual property, it belongs to the race, nay, to all Mind.

Feelings, on the other hand, are the individual's own. We can be quite certain that two persons never yet had precisely the same feelings. That as a general rule we can foretell how an event will affect nine out of ten persons depends simply on the fact that individuals are so much alike.

The Pedagogy of Feeling and the Pedagogy of Science. — As a result, the pedagogy of feeling presents a difficulty unknown to the pedagogy of science. In all science there is little danger of going wrong in one's development; and in pure science there is absolutely none. One either thinks right or not at all. Either you get algebra, or you don't; you can't get perverted algebra. But in the realm of our emotions we know of no unquestioned standard. Hence the opportunity for heresies and perversions is unbounded. That your emotional nature is fast developing and getting an education is not necessarily a good thing. You may be evolving in the wrong direction. A dili-

gent education may result in bad and perverted taste just as readily as in good taste.

THE NORM

There is difficulty in getting a norm, or standard, for our emotions. Some, in fact, assert that there is none. They insist that every one has a right to like what he pleases. This has found expression in the familiar Latin proverb: *De gustibus non disputandum*. Most of us, however, will agree that this is the very opposite of the truth. There *should* be discussion about tastes.

That which is injurious to the preservation or development of man as an individual and society is in bad taste. This will be admitted without discussion. The Chinese dwarfed feet, social pleasures that include intoxication, indecent pictures, and lascivious literature are all in bad taste, because they are injurious to the physical and moral health of man.

That which does not harmonize with its purpose is in bad taste. A bonnet is meant to protect the head from sun and cold. If it does not do this, but is a mere excuse for the display of trimmings, it is in bad taste.

We dare not say that what is unnatural is always in bad taste or that the natural is without exception in good taste, for man when civilized is an unnatural animal. It is natural to satisfy the appetites when one has the opportunity; and the child and the savage act in this respect naturally. But in spite of this, it would not be "good form" for one when invited to dinner to rush to the table and gorge oneself as soon as the opportunity offered.

We dare say, however, that all that is *antinatural* is ugly and depraved, for what is antinatural is also in disharmony with its purpose.

These rules, however, touch only the rim of the subject; they tell us of some things that are *not* in good taste. There is not, in fact, nor can there be from the very nature of the case, any formulated standard of good taste that is absolutely infallible and applicable to all cases. We have to fall back on this principle: *That is in good taste which strong, healthy, and symmetrically developed minds find agreeable and enjoyable.*

In the *application* of this rule comes the rub. We can apply only rule-of-thumb standards in determining what is healthy and symmetrical. On this score the opinions of mankind are continually changing, — we hope in a direction towards absolute truth.

The standard of good taste applied by the masses is simply public opinion. This changes continually. No better proof of this could be demanded than the constant fluctuations of fashion. How atrociously ugly are the fashions of ten years ago! Ten years hence the same will be said of the fashions of to-day! Still, we hope that the history of fashion shows progress toward better things.

AN ANALYSIS OF CULTURE

The result of the training of the feelings is called *culture*. Refinement is almost a synonym. True culture may be thus analyzed:—

(a) *Sensitiveness*. Feelings, whether lower or higher, come in response to a stimulus. The more alive we are, the more fully organized we are, the less stimulus

it takes to "set us off." Other things being equal, the more sensitive a person is, the more cultured he is. The healthily cultured person is easily touched by the sight of misery. He need not see a person on the point of dying of starvation to be moved to compassion.

(b) *Balance.* The truly cultured person does not go to extremes. He keeps his balance and his bearings. There is a quiet dignity about him which forbids emotional excesses.

(c) *Animal nature under control.* The substratum of man is animal. The very essence of boorishness, of lack of culture, is lack of control of the animal in man. It is a false culture which would eliminate the animal in man. This was the ideal of the society woman in the middle part of the nineteenth century, an ethereal, fragile creature who "partook of food" solely from a sense of duty, and tried to forget that she had muscles. The healthy taste of mankind revolts at such unnaturalness. But the lower nature, though strong, should be bridled, and the reins should always be in the hand of our spiritual nature. Hence the dinner table is a fine test of refinement. Gourmandizing is proof positive of lack of culture. Here a curious psychological fact meets us. Boorish behavior observed in another is sure to disgust a person of any refinement. But even persons of considerable culture fail to notice anything particularly disgusting in their own transgressions of this character. The test of culture is that the truly refined person has himself so well in hand, and is so thoughtful of the feelings of others, that he will keep the reins on himself taut all the time.

(d) *A taste for the simple as well as for the complex.* The barbarian can enjoy the simple and obvious only. His literature is strong and direct, and deals with the primary passions and impulses of men as manifested in a simple unsophisticated society. But as mankind advances in culture, it becomes interested in the subtler, the more complex, forces and phases of human nature, and in the more complicated situations that advanced civilized society presents. It advances from Victor Hugo, Dickens, and Molière, who deal with elementary obvious human nature, to Balzac, Henry James, and Walter Pater, who conduct us through labyrinths of psychic phenomena.

But that man is narrow and one-sided in his culture who has lost his interest in the open highways of the soul, for the lure of its mysterious byways. The well-balanced man always retains a supreme interest in the direct and ingenuous side of human nature. This artificial overculture which can no longer enjoy folk songs and tales of adventure, but must needs have only grand opera and novels of psychological analysis is just as narrow as its opposite, — frank ignorance of higher art, — and what is worse, is unnatural. Ignorance is simply lack of development; the man of artificial, superfine discriminations is the product of a wrong development.

MEANS OF ACQUIRING CULTURE

Value of Interests outside of One's Vocation. — Where should we seek for the means, the training, that will give us the right kind of culture?

It is a popular dictum to-day that every occupation,

every study has its culture value, and that it is therefore a waste of time to study anything merely for culture. Every one is urged to find his culture in his vocation. Latin and Greek, literature, music and art are superfluous ; for, it is said, one may gain just as much culture in bookkeeping or dentistry or mining.

Now, it is true that most fields of human activity have some cultural value, and it is most true that we do not appreciate enough the cultural value of common and near things and vocations ; but it is decidedly not true that all occupations are equal in culture value. The factory worker, the miner, and in fact the majority of the rank and file of the industrial army have to spend their working hours in surroundings and activities that are often bare of nourishment to the soul. They need some interests outside and above their daily drudgery, and their education ought to be broad enough to furnish them with an opportunity. And even those of us who, like the musician and the architect, have vocations that are surcharged with interest, whose workaday atmosphere is full of culture, should make it a practice to have some interest outside of our vocations to save our minds from getting stale. No man is more tiresome than he who talks shop all the time. The farmer who cannot talk about anything but crops, the teacher who always talks pedagogy, the lawyer who always speaks as if he were addressing a jury, what insufferable bores they are to us ! And then think what thrice insufferable bores they must be to themselves ! We all need a wider culture than that which appertains merely to our vocation. The idea that from whatever we study and do, if we can be interested in it, if we appreciate it, we gain just as much

culture as from anything else, is false, because it *does* make a difference *what* we appreciate. The person who can appreciate nothing higher than a beefsteak is not as cultured as he who appreciates music. And more, the appreciation of music is no substitute for the appreciation of nature. He has not entered upon his full human heritage who has failed to find something to appreciate in every department of his soul.

Value of a Broad Education. — The old American idea and ideal of education, of a broad and liberal culture, is after all the right one. The notion that each one of us shall find his culture exclusively in his own narrow occupation is a reaction to the Hindu caste system. No person can be said to have a liberal culture who is not trained in language, in literature, in mathematics, in the natural sciences, and in the social sciences. Just how big the dose should be in each department is another question, but any education which allows the pupil to grow up ignorant of any of these lines of culture has failed in its mission. Right here let me say that Latin and Greek cannot be sneered out of higher liberal education by the argument that they are useless subjects in the practical world; for in the narrow sense of the vocationalist *every* subject in the high school course is just as useless as is Latin. Not one pupil in one hundred except those who become teachers will ever get any practical use from his algebra, history, or nine tenths of his geography and arithmetic. Only those who become farmers will have any practical use for what they learn of agriculture. Manual training will be of no direct practical use even to the pupil who is to spend his life as a carpenter or furniture maker,

for the operations in building houses are quite different from those employed in the school shop in making a pin tray, and the modern furniture maker works entirely with machinery. Now, I am not saying that every high school pupil should study Latin, or even that any Latin should be taught there at all; but I say only that the attack on Latin that is now being made is not rational. And then let me whisper this to you: Nine tenths of those who attack the so-called classics in high school and college are those who never studied the classics themselves beyond a miserly high school course, and perhaps not even that. Before a man is allowed to set himself up as a judge to condemn the classics he should be required to translate at sight, say, a chapter of Tacitus. A great silence would fall on the arena of classical onslaught.

Exercises

1. What is there worthy of the appreciation of a truly cultured person in your present surroundings?
2. Culture may be divided into æsthetic and social culture. In what does social culture consist?
3. What is æsthetic culture?
4. Mention some social gathering you have lately attended, the purpose of which was mainly social enjoyment, and hence an expression of social culture.
5. What was your most recent school exercise in æsthetic culture?

CHAPTER XVI

HABIT

THE PHYSICAL BASIS OF HABIT

THE most fruitful theory of physiological psychology is that of the physical basis of habit and memory. When a current of neural energy passes through a nerve center, it leaves an impression, a trace, a "path" behind. When the next current comes to the same region, other things being equal, it will follow the path of the former current, unless otherwise directed by the will. For every current that passes over the "path," the "path" becomes deeper and more marked, and the stronger must the conflicting force be to divert the current from the beaten track. As our actions are determined by the course that the motor neural currents take through the nerve centers, this is evidently the physical basis of habit.

Care should be taken, however, to note that this idea of paths in the nerve centers is entirely theoretical. There is no evidence from dissection or microscopy to sustain it. And though the evidence as to the existence of these paths is very satisfactory, we have not even a theory as to the nature of the paths. All we know even by circumstantial evidence is that currents tend to follow the paths of former currents, and that the more a "path" has been traveled, the stronger is the probability that the next current will take it.

THE TWO CLASSES OF HABITS

Motive Habits. — Two fundamentally distinct mental phenomena are known under the name of habit. Acquired appetites and other acquired desires are called habits, as for example the drink habit, hot temper, a taste for literature, cleanliness. These are impulses to action and hence furnish motor energy for action. These we may call *motive habits*.

Technical Habits. — Skating, bicycling, the skill of the oculist, the art of the bricklayer and the blacksmith, are not, strictly speaking, motives for action at all. There is no impulse in his skill which drives the skater to skate. His *desire* to skate is quite distinct from his *knowledge* of skating. Still, thus far even such skill is an impulse; when he begins to skate, every movement will become a stimulus for the next. Hence even these habits may be called impulses. But not in our ordinary sense. There is no moral motive power in them. *Habit* when equivalent to *skill* or *art* means simply a certain coördination of muscular movements, and has no emotional value or motive force as have the true motive habits, such as the habit of intemperance. Let us call these habits, then, *technical habits*.

Often the two classes are mixed or rather coupled with one another. Thus, we say a person has the habit of gambling with cards. He has a desire for gambling, and he has skill in playing cards. But it is evident that the two are actually distinct affairs.

Happily for the simplicity of psychology, the laws of the two lie quite parallel, so that with one or two exceptions we may easily discuss them together.

FUNCTION OF HABIT IN THE ECONOMY OF LIFE

Without habit we should be doomed to spend our lives on trifles. The mechanical business of living, dressing and undressing, walking, eating, and the like, is very considerable in amount and very complex in nature. To this must be added the mechanical element in one's vocation. Think of all the complicated movements a housewife, a blacksmith, or a tailor must execute in a day. If every movement had to be directed in detail by consciousness, our attention would have enough to do with a small fraction of the mechanical routine of life.

Again, it is not possible to coördinate activities as perfectly when directed by attention as when done from habit. The trained penman, pianist, or athlete can produce more perfect results than any one who tries to do the same thing with conscious attention.

That which has become habitual is educated out of consciousness into subconsciousness. Hence the measure of perfection of a habit as skill is the absolute absence of the necessity of attention.

Habit an Acquired Impulse. — The story of habit is just the reverse of that of native reactions. The native impulses start as subconscious and "blind," and graduate later as desires in full consciousness and with conscious purpose. When we first practice an art, on the other hand, we are painfully conscious of the whole thing, including the purpose; but by degrees our attention can leave the subject until finally the acts may be performed as mechanically as reflex action.

In man's almost boundless capacity for forming arti-

ficial reactions — habits — he has a tremendous superiority over the lower animals, which have a very limited ability to form habits, that is, to acquire new reactions.

LAWS OF HABIT

Fundamental Law of Habit. — Since the nerve centers are living matter, the cells of which they are composed are continually being renewed. Worn-out tissue is being removed and new tissue put in its place. In so doing, the tendency in living matter is slowly to obliterate any changes from the normal. The “paths” are slowly obliterated, and we start to forget a habit the moment we have formed it. Hence the necessity of constant practice for the pianist, for example, to maintain his skill.

Thus, the fundamental law of habit formation is very simple: *Practice*; and the fundamental law of habit breaking is: *Quit*.

There is one way and only one in which to acquire a habit. It is by practice, repetition of the act itself. Only by skating can one learn to skate, only by getting into the water and pawing about with arms and feet can one learn to swim. Reading about bicycles and bicycling will never teach us how to ride a “wheel,” and the study of all the Latin grammar in the world will never teach us how to write Latin. *F'it faber fabricando*. Only by doing do we learn to do.

This is not denying that it is profitable and wise to study about the subject and to get as much theory as possible. It is well to know which side of the skate should be up, and what is the proper way to splash in the water when swimming. It pays to study psy-

chology and method before attempting to teach; but don't, please don't think you know how to teach because you can theorize ever so beautifully about it. But to know the theory of teaching will shorten your apprenticeship and save you from many mistakes.

When asked how he acquired his marvelous skill as a surgeon the famous oculist replied, "By spoiling a peck of eyes." By careful study the number of eyes sacrificed may be lessened, and by neglect of theory the peck of eyes may easily grow into a bushel.

The negative side of the rule likewise admits of no exception. It is absolutely necessary to abandon the practice that one wishes to unlearn. To be sure, medical science may cure the appetite for liquor by medicine, but even then it is necessary to stop drinking.

It seems well established that it is possible to get rid of a motive habit in an instant. There are many seemingly well-authenticated cases of persons who have been reformed in an instant by religious conversion — not simply so that they got new ideals, but so that they actually lost instantaneously their depraved appetites and desires. Cases of great psychic shocks seem sometimes to produce the same result.

Even, however, though we admit the possibility of losing an undesirable habit in an instant, it remains true that the ordinary way of getting rid of a bad desire (motive habit) and the only way of getting rid of a bad technical habit (for example, poor penmanship) is the slow return to the normal, the slow re-formation of the reactions which nature provides when we cease to practice the habit.

Secondary Laws. — There are many canny and shrewd observations made by moralists, preachers, and psychologists on the subject of our habits. Here are a few:—

(a) *Prepare to pass safely over the critical period.* It is easy to act on a good resolution just after it is made. To those who are addicted to New Year's resolutions the first of January is a saintly day. But this cannot be said of the second of January. When the emotion that accompanied the resolution passes away, as it must, then comes the critical period. The habit is not yet established, it is foreign to our being, and there is no emotional support. When the smoker resolves to stop smoking, it is "dead easy" to refrain the first day, and perhaps even the first month. But soon the time comes when the holy ardor of reform is gone, but the desire for a smoke is still as strong as ever. Then the good resolution is generally shattered.

If you really want to stop smoking, prepare to pass over this critical period. Tell all your friends of your resolution, and brag of your strong will power. Wager with some one to forfeit a goodly sum if you once more touch the weed. Stay as much as possible in company and in places where smoking is out of the question. Don't keep tobacco in the house.

(b) *Make no exceptions.* Exceptions are expensive. When breaking an old habit especially, exceptions are more than expensive. They are fatal. When we stop practicing a habit the old habit channels are slowly filling up. But here comes an "exception" along the old channel, sweeping it clear with one "flushing." Innumerable instances might be related, like that of

John B. Gough, of persons addicted to liquor who, after years of abstinence, in a weak moment have taken "just one glass." Instantly the poor fellow is back in the bonds of the drink habit. The one exception has destroyed all that years of abstinence have built up, and opened up the neural channels of a depraved appetite.

(c) *Take every opportunity to practice a new habit, and make opportunities when these do not spontaneously offer themselves.* This complements on the positive side what has just been said on the negative. Repetition alone makes habit, skill, mechanical memory. Practice, repetition, drill, not strenuous resolution and emotional enthusiasm, give us the art, the skill, that we want. Hence, if you want to learn to do a thing, begin to do it. Repeat. If you are short of opportunities, make them. Set apart a few moments every day for your exercise. If you want to qualify for the village band, practice awhile on your cornet every day. Your neighbor may feel like mobbing me for giving you this advice, but it is nevertheless the only way to success.

(d) *Be exact in your practice.* In engraving a character, if the engraver is careless and lets his instrument scratch anywhere and anyhow, his work will be a failure. So in carving out our habit channels, if we "carve" ever so diligently, and carve in the wrong place, we are doomed to disappointment. Slovenly, careless, inexact repetition is not only worthless, it is positively injurious. When bent on acquiring some skill or art, do your practicing right, or don't do it at all. And it may be noted that it does not matter in acquiring a habit whether we do a thing willingly or

under compulsion, nor whether we attend to what we are doing or not. All that counts is the *act*, and nothing counts but the act. Some psychologists tell us that attention is essential, and that we will learn the habit with a speed in proportion to the amount of attention we pay to our practice. This is a mistake. There is no virtue in attention in habit getting. Only this: To acquire any skill it is of vital importance that we perform the act *exactly right* in practice. Now, this often necessitates attention. The piano student who plays his exercise wrong is told by his teacher: "You must have failed to pay attention when practicing." And this is probably true. But what hurt the pupil was not directly his lack of attention, but the *result* of this lack of attention, viz., that he practiced incorrectly. Pay enough attention and exercise enough care to make your repetition of the act *exact*.

HABIT AND AGE

If we are allowed to make two assumptions, we can make psychology and physiology agree beautifully in this matter of habit. Physiological psychologists have assumed, though they have never proven anatomically (a) that the neural substance is plastic; and (b) that this plasticity decreases as the age of the individual increases. Now, it is a fact that in childhood we acquire habits very easily, and also lose them readily; while as we grow older we find it gradually harder to acquire new habits, but also that it is easier to keep them; and in extreme old age it becomes impossible to learn and impossible to forget what was learned in younger years.

The Relation of Habit to Education. — This, of course, is simply the scientific basis for the doctrine established long before there was any kind of book psychology: that *youth is the time for education*.

(a) We should not attempt to train a child in any habit or skill before (1) his muscular and nervous systems are developed enough to perform movements of such complexity and precision, and (2) he has the ability to keep with reasonable practice the habit he acquires.

I knew a child of four years who memorized all the names of the states of the Union and their capitals. But when he began attending school he had forgotten them all. As mechanical memory and habit are identical, this is an example in point.

(b) The mechanical part of education is acquired with least effort in late childhood and early youth. Penmanship, drawing, singing, elements of playing musical instruments, dancing, swimming, skating, bicycling, deportment in society, the elementary use of common tools, and all of that element in book studies which requires much mechanical memory, are acquired best and with least effort before the age of sixteen.

HABITS AS ELEMENTS IN CHARACTER

The foundation of a good character lies in good habits. In the first place, we must be equipped with a set of technical habits which take the drudgery of routine work out of conscious, voluntary life and make it mechanical. Without a set of such habits our whole life would be spent in the mere routine of existence. Dressing and eating would occupy our whole attention.

Secondly, our everyday morality should be habitual. There should be no necessity of appealing to the will at all. A properly trained adult should do the right thing from habit because it never occurs to him to do anything else. It seems only natural to him to do the right. In nine hundred ninety-nine cases out of a thousand he does what is right without ever thinking of the possibility of doing anything else.

Personal Habits. — Personal habits should be acquired before adolescence, if conditions are ideal. By this we mean habits of behavior in company, of dress, manners at the table, carriage of the body, and habits of personal cleanliness. It is possible to get the habits, the air, the behavior that should go with a cultured, refined, high-bred gentleman or lady later in life; but if this training was not acquired in early youth, there is usually something exotic and artificial about the result.

Moral Habits. — Moral habits should, of course, be inculcated from earliest childhood, but the vital age for the formation of moral habits is early adolescence and the half dozen years that follow it. But this is precisely the age when it is most natural to scorn conventionalities and to have a burning desire for originality and individuality at any price. Now, while independence and individuality are fine things, one may easily pay too high a price for them. Here the authority and diplomacy of parents and teachers should be directed towards the securing of correct moral habits, especially during early youth. Contrary to common opinion, there is no necessity of allowing the young blades to sow their wild oats. True, great men often

have seeded acres of this pernicious cereal, but they became great and good not because of it but in spite of it. Many and many a man, great, small, and middle-sized, has failed to grow to his full stature because of his "free and unconventional" life in youth. Worst of all, some varieties of wild oats do not mature before late in life. An acquaintance of mine, a man of great ability and strong passions and appetites, lived a "generous" youth of this variety. He was not averse to a "spree" at times, but very rarely could the effects be detected the next day; in fact he was never intoxicated up to, or rather *down* to, the policeman's standard. But he straightened out when his college days were over, and became a very prominent clergyman. To all appearance he had mastered his bad habits, and now lived a blameless life. In reality he was keeping up his bibulous habits in secret. But the day of reckoning came. His indulgence was slowly undermining not only his physical system but also his power of self-control. When the afternoon of life set in, he found himself unable to cope with his appetite any longer. He succumbed. To-day he fills a drunkard's grave.

Danger of Habits becoming Masters.—The daily routine of life and of business should be carried on as automatically as possible. For every ounce of energy we save from the business of running the mechanical part of existence, we have an ounce more of energy for higher things. But there is always the danger that habits, from dominating the nervous mechanism, will begin to dominate the personality. Such an ossified character is very comfortable, but wholly contemptible. The possessor loses the ability to change his opinion,

to make a new initiative, to take a fresh view, to do anything unbiased or unprejudiced.

Hence the cure: Don't allow yourself to fall into a rut. Take a vacation from your regular business at times and engage in some other work (not play) for a month or a year. Have some recreation or amateur pursuit as different as possible from your regular business. Take up a new language or a new science every few years throughout life. Review your college course with your son when he goes to college. Thus we might go on indefinitely. The nub of it is to get out of the rut—not permanently, for the rut serves the same purpose as the rail to the locomotive, but just long enough to prove our humanity.

Exercises and Illustrations

1. Prove that mechanical memory and habit are, in reference to teaching, identical.

2. Which is the better way of memorizing the multiplication table: repeat it over and over again as fast as one can until learned, or repeat it once a day until learned, or repeat it half a dozen times a day until learned?

3. Why is "tapering off" usually a deceptive plan in getting rid of a bad habit?

4. How would you correct a pupil's bad carriage?

5. How would you habituate yourself to rising early in the morning?

6. Illustrate the psychology of habit by the formation of new channels for water in a delta of a river at flood times.

7. Illustrate by a character in history: (a) the power of habits; (b) one of the secondary laws of habit.

8. Define: *habit*, *custom*.

CHAPTER XVII

IDEALS, OR RATIONAL INTERESTS

IMPULSE AS A MOTIVE FOR ACTION

Instinct. — In the preceding chapters we have studied our lower interests, or motives. We have found that our lowest fully conscious motive for action (lowest in the sense of least evolved) is instinct, or blind impulse. This is a mere pressure in consciousness toward a certain activity. The person subject to the instinct has no purpose for his action. The stimulus that brings the instinct into action is generally a physical stimulus of nerve endings. Thus the stimulus of an empty stomach brings on the instinctive craving for food which we call hunger. But sometimes an "idea" may be the stimulus for an instinct. Thus at hearing a threat, one will quite instinctively put one's self in an attitude of defense. Here the stimulus is not the sound, but the idea conveyed by the threatening words.

Desire. — Next comes desire. A desire is an instinct plus a purpose. The object of the desire is always in the future. The motive force in a desire is the present longing for something thought attainable in the future. Thus the boy who gets up at three o'clock in the morning to go fishing has no interest in the walk to the boat, certainly finds no interest, no motive, no delight in breaking off his sweet slumber at so unseasonable an

hour, but the delectable joy of fishing which lies beyond the vigil and the walk has attraction — motive power — enough to drive him out of bed and into the boat. Hence a desire is a pressure in consciousness towards the obtaining of the result of some action.

Impulse dependent on a Stimulus. — In one respect, then, all actions determined by impulse are alike. The awakening of the impulse depends on the presence of the appropriate *stimulus*. Hence all such actions, whether from desire or instinct, are determined from *without*. You see an orange. This sets the imagination to work, and you enjoy the imaginary pleasure of eating an orange. This forms the stimulus that excites the desire to get the real orange. If you act on this desire, your act is wholly determined by the presence of that orange. A child happens to think of the pleasure of coasting. If the image thus awakened is a stronger stimulus to the awakening of impulse than that in which he is engaged — say sawing wood, — he will leave the woodpile and start for his sled and hill. As long as a person's activity is wholly determined by impulse, he is at the mercy of his environment. In whatever direction the stimulus of his environment is strongest he must needs follow. Given the mechanism and the nature of the environment, the resulting activity is perfectly predicable.

The images of future pleasures and pains form, thus, a very important class of stimuli for action. In fact they are always the stimuli in the case of desires. As images of pleasures and pains become weaker the farther off the reality is for which they stand, the rule is that persons determined wholly by impulse always choose

the smaller proximate good in preference to the greater good farther in the future. The boy saving up dimes for a bicycle is very likely to spend it on candy and circus tickets because the hope of a brief taste of elephants and gumdrops ten minutes away produces a much more vivid stimulus to activity than the distant hopes of years of "century runs."

The Intermittent Nature of Impulse.—In both instinct and desire the motive, or interest, is indissolubly connected with the accompanying feeling, and varies in strength directly with the feeling. In fact it were hardly inaccurate to say that the motive force of both instinct and desire is the feeling. Thus, the longing for food is precisely proportional to the sharpness of the feeling of hunger. The more bitterly one feels the insult, the more powerfully is one tempted to "get even" by retaliation. As soon as the poignant feeling of anger cools down, the desire to inflict pain on one's adversary vanishes.

Feelings vary continually. They seldom last long, and while they last, they have an ever varying intensity. Since the motive power of a desire or an impulse varies directly as the feeling, the result is that action from instinct or desire is always intermittent.

If the present longing were the highest motive we possessed, human achievements would never amount to very much. A young man starts out to get an education. An education seems to him desirable. As he takes the train for college he is fairly burning with longing for learning. But how long will this longing last? To be precise, we must admit that it cannot possibly last longer than until he falls asleep. But it

will reappear as soon as he awakes and hold an intermittent sway with hunger, thirst, worries in passing examinations, and a thousand other feelings for, perhaps, the first week. Then the desire for learning will fail to appear. Homesickness, a proclivity for sports, pure laziness, or some other desire will occupy the boards to the utter exclusion of erudite longings. Frankly, he finds learning a bore, and though he knows that an education will be of inestimable value to him, he can't yearn for it. If desire is the highest motive of which he is capable, that is where he "fails," unless parental compulsion carries him along.

The savage is actuated mainly by desires and instincts. Hence, when hungry, he will hunt assiduously, and even when not hungry, if a specially tempting opportunity comes to him, he will work hard for food, because there is at such times in him a strong longing for the future feast. But when his hunger is satisfied and there are no unusual inducements, the longings for rest, for society, or for war are usually stronger than the longing for provisions even though he knows in a cold, intellectual way that before another course of the sun he will again be hungry.

A HIGHER MOTIVE FOR ACTION, RATIONAL INTEREST

If desires were our highest motives, we should all be in the condition of the savage or the irresponsible schoolboy. But there is a higher motive. There is an interest in us that is not bound to our longings, our yearnings, our emotions. We have the power of choosing ends for our activity, and these ends have a motive force quite independent of our desires, that is, of our longings.

Thus the student, if he is of the right sort, will continue his studies just as faithfully after the bloom of his romantic longing for an education has worn off. The farmer will get up early and lie down late, and fill in the time between with hard work for many a weary day because he has made it his abiding purpose to raise a crop that summer. His longings and yearnings shift a thousand times during the summer, and for long stretches of time he never thinks of the joy the crop will give him, but still he keeps on steadily, persistently working for the end he has set himself.

A man gets his fishhook in his finger above the barb. He takes his knife and deliberately cuts out the hook. The marvelously simple hedonistic psychology explains this action thus: More pain would have resulted from having the hook in the finger permanently than was caused by cutting it out; his desire for the greater quantity of pleasure was greater than his desire for the less quantity; hence the hook was cut out. This is juggling with the meaning of the word *desire*. When the knife approached the quivering flesh, there was only one desire, longing, conscious pressure, in that man's mind of any appreciable magnitude and that was *don't*. He knew, of course, perfectly well, that it was best for him to get that hook out, however it smarted, but this was a cold, unemotional intellectuality, and there was not room in his conscious field for any other emotional motive than the vivid shrinking of quick flesh from the knife.

There was only one desire there, and that was all against the surgical operation. And still the man, if strong-minded, acted contrary to this desire, for he had

a motive that did not depend on feeling, he had a rational interest which was stronger than the emotional interest.

This motive which is independent of feeling we have called the *ideal* or *rational interest*.

Rational Interests the Result of Deliberate Choice. — Man, then, has the power to choose ends for his activity, and to endow these purposes of his with a motive force that is wholly independent of impulse. These chosen purposes, or, as we shall call them here, ideals or rational interests, differ fundamentally from desires and instincts. A desire chooses us; not we the desire. I like oranges, not because I once chose to like oranges, but just because it is a part of my nature to like oranges. We get angry, we desire to imitate, we love, we hate, not because we have “made up our minds” so to do, but because when the proper stimulus comes upon us, the desire follows, wholly irrespective of our will. It is not so with our ideals. We do not have them until we have chosen them. All purposes are not chosen purposes. Some we get gratis with our desires. But until a purpose is chosen as a rational interest, it has no motive force beyond what the emotion gives to it. It is in the choosing that the purpose gets that independent-of-the-feeling energy that elevates it into an ideal.

By their very nature, all desires are bound to fluctuate. If by affection we mean an emotion, there is no such thing as “constant affection.” The most amorous swain will lose momentarily every vestige of love for his lady by such a trifling thing as a carpet tack driven three quarters of an inch into his foot.

As far as his feelings are concerned, that carpet tack will for a few seconds fill his whole being. But ideals need not fluctuate. We may follow the same ideals for weeks, months, years, yes, for life.

Exercises

In the following determine whether the act is done from impulse or rational interest :

1. Sneezing.
2. Eating dinner.
3. Studying this lesson.
4. Going to a reception.
5. Attending some function "from a sense of duty."
6. A man's drinking until he becomes intoxicated.
7. The boy's good behavior, because he fears he will otherwise be punished.
8. Washington as commander in the Revolutionary War.
9. Benedict Arnold, when he betrayed West Point into the hands of the enemy.
10. An army charging a fortified position.
11. An army retreating step by step in good order.
12. Training for a game.

CHAPTER XVIII

OUR SELVES

OUR RATIONAL INTERESTS, IDEAL SELVES

WE have seen that human activity of the highest type is not determined by impulse. Man chooses an ideal, and having determined that it is the best for him, he follows it both when it agrees with his feelings and when it does not. Very often lines of activity, not conducive to his chosen purpose, *feel* more attractive than his ideal, but he has the mysterious power of determining his activity without reference to present feelings.

Another way of expressing the same truth is this: When man becomes explicitly rational, he gains the power of objectifying himself, *i.e.* of forming a distinct notion of himself. Now, if he is worthy of his high dignity of rationality, he will cease to be controlled by whatever stimulus happens to be the strongest, he will cease to be controlled by his momentary impulses, he will take an inventory of his present powers and opportunities (his present self and environment) and construct an imaginary *future self* that he deems worthy of his best efforts. He will determine to realize this future self, and from that moment, this future self becomes the supreme motive from which all his rational activity springs. Such a future self, chosen

as the aim and motive power of activity, may be called *an ideal*. In every instance we shall find that our rational interests always center in the self. Our ideals are all future selves to be realized. John decides to get an education. He has chosen, as the rational thing for him to seek, an educated John. This is his ideal. James decides to propose to Alice. Strictly speaking, James's ideal, in the sense of rational purpose, is not Alice. The ideal which he tries to realize is James-married-to-Alice.

But although one's rational interests all center in one's self, this does not mean selfishness, as we shall presently see.

OUR SYSTEM OF SELVES

The center of our interest is our individual self. This, with his mother, is all in which the little child is interested. As the child develops, other persons come within his sphere of interest: family, friends, neighbors, community, nation, humanity, and finally all sentient beings.

Thus the "self" normally expands until it includes the universe. The schoolboy's interests are limited to the future happiness of himself, his family, and his friends. He will rise at five in the morning to give himself a long holiday to spend in fishing. He will deny himself heroically to buy his mother a Christmas present, for he is interested in his mother; he loves her. He will risk his life to save a comrade from drowning, for his comrade is a part of his larger self. And this is not selfishness of a sublimer sort, as the hedonistic philosopher would have us believe. He is not

figuring: "Now if I let Jim drown, I will lose a most enjoyable companion." Nor does he even reason: "I'll never forgive myself if I let Jim drown; I shall suffer from remorse as long as I live." He is directly interested in Jim. He is just as directly interested in Jim as in himself. Jim is a part of his larger self. But he is not interested in the future of his town. He is not public-spirited. He is not yet conscious of the fact that his community is a part of himself.

Here is where some people stop developing. A person of narrow sympathies, who is selfish and lacking in public spirit, is simply a case of arrested development. Our sphere of interest should expand with our sphere of knowledge.

Thus, the youth ought to add the community to his self. He ought to become public-spirited. A normally developed adult will sacrifice much and work hard for his school, his town, his fraternity, his "set." He is a "good fellow," he is not stingy or close. He is "right there" when he is needed. He is public-spirited.

The normal adult is also *patriotic*. That means he has taken his country to his heart, and made that a part of his self. He loves his country and its institutions. Unless he is a pot-hunting politician, his interest in politics is mainly to make his country a better country, its laws more just and its institutions more effective. If his country is threatened, he will rush to the front and risk his own life in defense of his flag. He may even rise to that dizzy height of patriotic perfection of paying his taxes without a murmur. What is more, he loves all humankind. He loves his

neighbor as himself. He would not rob or cheat a foreigner, or leave him unaided in distress any more than he would a fellow-countryman. He does not desire a war in Argentina that the price of his wheat may rise. He would not desire his own country to gain an unjust advantage over another nation.

Many fail in thus universalizing their sphere of interests. Many good men who would not take advantage of a neighbor's misfortune rejoice in the calamities that befall another nation, if thus their own business prospers. Many a fine fellow cannot appreciate the utter immorality of the toast. "My country, may she ever be right; but right or wrong, my country!"

But our self should have even a wider sweep. It should include all sentient beings. The dumb animals have a claim upon our sympathy. But here mankind is far from its ideal. Commercial travelers are justly famous for their kind-heartedness, but how many ask the driver to spare the overdriven livery team? Many a young lady is too fastidious to bait her own fishhook, but she is hard-hearted enough to have her companion impale a live minnow on her hook. The average fisherman never thinks of saving the fish from unnecessary torture.

Place a sheet of paper over a magnet. Sprinkle some iron filings over the paper, and jar it slightly. The filings will arrange themselves in a starlike form around the magnetic center of force. Likewise we all rationalize life more or less perfectly. All the activities of our lives that we succeed in rationalizing radiate from our self, or rather our system of selves. In fact, everything in the universe falls in line and is evaluated by

our system of selves, our organized sphere of rational interests. Thus following, and modifying, James, we may say we have an individual self, a family self, a community self, a national self, a humanity self, and a religious self which includes an interest in all beings with God as the Supreme Being.

Just here it is interesting to notice Professor James's theory of the "social" self that "a man has as many social selves as there are individuals who recognize him and carry an image of him in their minds." An enormous amount of our striving and worrying in this world is centered on our social selves. Many a man has ruined himself by extravagant display just because he could not bear to think that his social circle should image him as a man in straitened circumstances. Whenever we are ashamed or proud or vain or restive under criticism or happy with applause, it is some of our social selves that concern us. Carrying this idea a little further, we do not merely have individual social selves. All our larger selves have their social counterparts. Countless opera heroes have proved the universality of the sentiment, "I'll knock any one down who tries to besmirch my mother's honor." Such a sentiment always brings applause from the galleries. A derogatory remark on one's nationality awakens a quick response in defense of one's national social self.

THE HISTORICAL EVOLUTION OF IDEALS

In primitive society it was of utmost importance that the lower emotions and impulses be highly developed. The strong, brutally aggressive fighter, who saw to it that his lair was supplied, was the successful in-

dividual then. *Now* such a person is an "undesirable citizen."

In the very kindergarten class of society man must cease to be a fighter and become fraternal. The delightful directness of life is lost, that frank immediateness of action and stimulus that give such a charm to the life at the frontier and in the wilderness. Man must cease to rely on his fist and his sword and must instead go to court with his troubles.

Militarism. — But even until this day the nations of the world *as nations* are in the fist-right state. Nations in war continue the appeal to brute force. So while fighting between individuals has been tabooed as very wicked, fighting as a soldier has been extolled to the skies as the greatest of the virtues.

Militarism is rampant even in civilized lands for several reasons. First, because pugnacity, fighting courage, is the oldest and most deep-seated of our virtues, and hence, nothing makes a more universal appeal in all ages of life and to all classes of society. Second, governments and potentates depend finally for their existence on the fighting ability of their peoples. Finally, demagogues find that humanity can be best "worked" from this side.

Commercialism. — Just as primitive society favored the fighting instinct, so modern society favors the property impulses. "To him that hath shall be given," is our motto. Society now looks for industrial efficiency. Thus the big prizes in the world are mainly for the victors in the industrial competition. Rothschild, Vanderbilt, Rockefeller, Morgan, Krupp, Carnegie hold the center of the stage in the modern world. Hence

the property instincts and ideals are inordinately favored by present society. Because the getting of daily bread is such a difficult business for a large portion of humanity, and occupies by far most of its active time and thought, the tendency is strong to make industrial efficiency the main requirement of our ideal, and the central element in character.

The True Ideal. — But our better nature protests against this sordid view. Just merely keeping alive cannot possibly be the main and ultimate purpose of life. That would be reasoning in a very vicious and very narrow circle. Humanity is all the time evolving a broader and more unselfish sphere of interests. One who is adjusted to our advanced society, whose sphere of interests and sympathies include the whole world, who keeps the proper balance between his social and selfish interests, and who puts the emphasis on the higher things of the spirit, he has the true ideal.

THE DEVELOPMENT OF THE IDEAL PERSONALITY

The Choice and Renunciation of Selves. — In the language we have adopted here, we have unnumbered potential selves. Of these we must choose a comparatively small number for realization. Thus, I have a holiday, and there are twenty tempting ways in which I may spend it. But I can spend it in only one way. If I go fishing, I cannot spend the day in the city or in visiting my uncle. Hence, my choosing fishing means denying myself nineteen pleasant holidays. A young man chooses his life work. He decides to become a lawyer. But in so doing he turns his back upon hundreds of occupations. He might have become

a physician, clergyman, artist, blacksmith, journalist, or sailor; but all these possibilities become impossibilities the moment he is committed to the lawyer's course. Thus a choice of an ideal, of a rational interest, involves limitation and negation. Only he who has courage to be ignorant of many things will ever be wise in one. The "jack of all trades" is ever the master of none. When accidents happen, the difficulty is that every one tries to do a dozen different things at once, and so nothing is done. It is the same in every situation in life. We must deny ourselves and renounce an infinite number of potential lines of action to become effective in one.

The Ideal Human Personality. — Our true purpose in life is the building of a noble human personality. The ideal personality is one whose rational interests have been organized into an ethically just and practically useful system.

In the nervous system the higher centers exercise an inhibitive power over the lower centers, and this indicates the proper scale and gradation of our impulses. Our lower animal self should be in subjection to our social and spiritual self. To attain this end, however, it is necessary to favor in every way possible these higher aspirations and interests of ours. For our lower nature is centuries older than our nobler impulses, and the tendency to a reversion to an earlier, cruder, and baser type is strong. It is the path of least resistance. In the training of the emotions and impulses, then, the proper gradation of values should be observed, and a balance be secured between the higher and the lower. The ideal character is not one

in which the higher impulses and feelings *alone* are developed, but one in which the whole individual is harmoniously developed with reference to our present civilization — one with well-developed lower impulses and feelings, but with these strictly subordinated and subjected to the higher. Philosophically we may say that our ideal should be to realize in thought, in feeling, and in action our unity with all mankind, with the universe, with the Divine Mind, and at the same time to realize our individuality. We should live in harmony with all creation; but harmony does not mean a Buddhistic coalescence with the divisionless sea of being. Rather it means preserving and fostering our own individuality, but only in harmony with the divine moral order of the universe.

This ideal may be regarded as eternal and unchangeable. But mankind is developing. And as the individual and society change, the combinations and proportions in the elements of an ideal character change also.

When a member of a savage tribe is brave and loyal to his tribe, and conforms to their notions of morality and religion, he has reached the highest form of character possible in that stage. He may be a dirty savage, leading a life absolutely at variance with civilized standards of right living, but he is living true to the highest ideal possible to him.

Thus the actual ideal which good men set before themselves is evolving through the ages and constantly approximating, in healthy ages, the absolute ideal in the Divine Mind. But it does not approach the divine ideal in a straight line. Rather may we say that the

course is that of an irregular spiral, always aiming at a point a good deal to one side of perfection, but on the whole higher than before. And the aberrations from the true course seem roughly to balance one another, so that what was lost by a tendency too much to the left in one age is balanced by an error to the right in another.

Exercises

1. Name the ten greatest Americans. How many of them gained their fame in war?
2. Name ten characters from history (not American). How many of them are military men?
3. If Richard the Lion-hearted had lived in our day, what of his fame and career?
4. How many of the present multimillionaires would have been heard from, if they had lived a thousand years ago?
5. If commercialism is favored by our age, why not adopt commercialism as our ideal?
6. Why keep any subject in the curriculum of the schools which does not pay in dollars and cents?
7. Draw a diagram illustrating our system of selves.
8. Even as late as the sixteenth century, on many coasts of Europe, the inhabitants lured foreign ships on the rocks by false lights, in order to get goods from the wreck. These same people who did such dastardly deeds were fond fathers and fierce patriots. What was the matter with them psychologically?
9. John cries if his brother is punished in school, but laughs and jeers if any other boy "catches it." Explain his selves.
10. Show how we may make our choice too narrow as well as too wide, in the matter of selves.
11. Give examples from history of persons who have chosen and realized remarkable selves, and state in the language of this book what these selves were.
12. What is the difference between an impulse (an emotional interest) and a rational interest (an ideal)?
13. When you studied this lesson, were you actuated by emotional or rational interests?

CHAPTER XIX

THE WILL

TWO CLASSES OF VOLUNTARY ACTION

Two very different classes of action are spoken of as voluntary. (a) Ordinarily we have the power and time to inhibit our impulses. Hence when we allow an impulse to pass into an action, such an action is said to be voluntary. The following examples will give an idea of this class of voluntary actions. A finger itches; I scratch it. At the table I am offered some food; I eat it. People weep when sad and laugh when amused.

The function of the *will* is wholly negative in these cases. We simply will nothing when we do such actions. But when we refrain from doing them, we do exercise the will in inhibiting the impulse.

(b) Actions done from rational interest, that is, actions controlled by an ideal, are voluntary actions in a higher sense. They are positively willed. Anything a person has "made up his mind" to do is truly a voluntary action. For here will power is pretty sure to be needed.

Our ordinary use of the words *wish* and *desire* both as verbs and nouns cover both the meanings of desire proper and of ideals. This creates no end of confusion in psychological and philosophical reasoning. Thus, "I wish to study Greek" may mean that at the moment of speaking I have a longing for this linguistic

study ; or it may mean simply that I have concluded that it is best for me to study Greek, though at this particular moment I may not have any feeling one way or the other. "His greatest desire was constantly during his whole life for military honor," cannot mean that he was constantly conscious of a tension accompanied by feeling towards deeds of "glory," and that this longing and feeling was always during his whole life strongest. He must have been hungry sometimes. He must have thought of something else sometimes. No person rightly out of an insane asylum is such a monomaniac as to have one emotion constantly during a whole lifetime. So what the sentence must mean is : His ideal was ever military glory ; that is, he had chosen military glory as that which was most desirable to him. In this work, we always mean by the term *strongest desire* the strongest pressure or tension in consciousness towards activity at any moment, irrespective of whether this happens to be that which we decide on the whole to be the best thing to do.

The ideal when chosen as the desirable goal of action is usually and regularly accompanied by a strong desire (and then also, of course, feeling). But when the feeling and the desire went out like a burnt-out match, the ideal remained as strong a motive as before. Usually when the mind is rested and turns anew its attention to its ideal, the old fire of desire flames up again with all its former heat. But when the desire and its feeling die down again, the ideal may be by the use of will power as effective as before.

The Struggle between the Ideal and the Desire. — The fact that the ideal can be a constant motive inde-

pendent of the shifting and fitful winds of desire and feeling makes it possible to work on steadily, peacefully, and evenly towards a chosen goal in spite of the fact that impulses (desires) with their feeling are in a constant flux and sometimes entirely absent.

The moral arena is here. This is the battle ground of will. The battle is ever between the ideal and the desire. The temptation is ever to follow the momentary desire, and all desires are ever "momentary" and nothing else, for a desire that does not exist this moment does not exist at all. The moral victory always consists in following the ideal chosen by contemplation.

THE MOTOR PROCESS AND THE VOLUNTARY PROCESS

The Motor Process. — The stream of thought is constantly passing out of subconsciousness in the fringe towards the center of attention and then out again into the fringe of subconsciousness. What particular images and thoughts are to pass into this vortex depends, the will being absent, upon the impulses, habits, and desires. Using *desire* as a common name for the three, when the will is inactive, the *strongest desire* will always conquer; that is, whatever image is in the center of attention will be expressed in action.

Thus the motor process is this: Will being absent, the strongest desire determines the image in consciousness; as soon as an image appears in consciousness, it is immediately acted out. Hence this is the psychic series: *strongest desire — image — action*.

The Voluntary Process. — The will may change the psychic series fundamentally. (a) By an act of will we

may refuse to think on the subject of our strongest desires. We are not forced to allow the center of attention to rest upon the object of our strongest desire. The power of voluntary attention, then, is the essence of the "freedom of the will." Voluntary attention is the most expensive in nerve efforts of all the functions of the mind.

(b) The will may inhibit the action that naturally follows the presence of an image in consciousness. This makes thought and imagination without action possible.

The voluntary process, then, is very simple. We simply imagine the act we will to do, and — that's all. The *complex* affair is *not to act*. A great deal of our training in character consists in learning to inhibit the action that naturally follows an image. What requires explanation is not our willing-to-do but our willing-not-to-do. There is where the fiat of the will occurs. In willing to do anything, we simply imagine the act and "let go."

GENERAL CONSPECTUS OF THE ACTIVE SIDE OF HUMAN NATURE

The body as a physiological organism functions by *motor impulses in subconsciousness*. Some of its processes, like breathing, may be at will brought into the voluntary sphere. The body is also protected by means of reflex actions of subconsciousness.

Instinct (or blind impulse) is almost wholly responsible for the conduct of the young child. Instinct, or blind impulse, together with habit and desire, always continue to manage the greater portions of our lives

measured in time. Still very few of our conscious moments are out of the grasp of the will and our rational interests (ideals). This seeming contradiction is solved as follows:—

When I awake in the morning, habit is usually sufficient to get me out of bed, perform the morning ablution, and dress. That is, no specific resolutions of the will are necessary. If I have routine work, there is small chance that anything but habit will be necessary to run me all day. Still I am under the control of my ideals, for, some time in the past, when I chose my business and habituated myself to my daily program, I did use will in conforming to my ideals. But suppose my day's work is not all cut out for me. Then I must decide what to do. Then will power is needed. It is a beautiful day, and I am fond of picnics. Of several attractive ways of spending the day, this is the most attractive. Hence this is my strongest desire.¹ Imagination begins to picture all the steps preparatory to picnic going. But I am not sure that such a course is in line with my rational interests. So I inhibit the actions that regularly should follow these ideas. After some deliberation I decide that it is best that I should write this chapter instead. I choose the writing of this chapter as my ideal, my rational interest for the day. At first I have to use voluntary attention to pin myself down to the work. That is, I must by a sheer effort of the will keep the center of attention on my work. But soon I get interested in my work, forget sylvan attractions, and my strongest desire at the moment is usually just what I am thinking about and doing. So that,

¹ See above, definition of strongest desire.

after all, only during a little fraction of the day have I been forcing myself to abstain from following my strongest desire.

This is the universal rule. Normally we get interested in our work after a few moments of voluntary attention, and as soon as we get interested in the work set us by our ideals, our desires and our ideals are in line and there is no conflict.

Since no impulse or desire can last long if denied expression and attention, we align our desires with our ideals by keeping, through an act of will power, our attention on the course of action prescribed by our ideal. Restricted to that field, the right desire will arise in response to the only stimulus allowed, and necessarily pull in the same direction as our ideal.

THE EDUCATION OF THE WILL

Where Military Discipline Fails. — The proper education of the will presents the most difficult problem that teacher and parent have to solve. It is not a simple affair like the pedagogy of habit. That is where military discipline fails. The soldier, precise in his habits as a machine, is not famous for his will power. The discharged soldier will to the end of his days keep his soldierly bearing and address, and most of his orderly personal habits; but for all that many a one becomes a moral wreck.

The system of close supervision and military discipline in schools is equally successful in teaching good habits and inadequate in training the will aright. Suppose a pupil is every moment of his waking hours under the watchful eyes of a custodian, suppose that his every

action is prescribed. That may provide for most excellent habits, it may prescribe an exemplary life in every detail, and still in one respect it fails not only to provide training of the will, but absolutely prohibits any such training.

Need of Allowing Freedom. — In order that the will may be trained, there must be freedom. But when there is freedom in which to exercise the will, there is of course also freedom to go wrong. Hence we are face to face with what seems like a contradiction.

Still that contradiction can be solved. Begin by giving practically no liberty. The circle of liberty at first is merely a mathematical point. As children advance in age and experience give them a little more freedom. If they prove worthy of this freedom, increase it; if it is not wisely used, let a part of the punishment be a decreased sphere of freedom.

This can be applied in dozens of ways. Rules, regulations, and restrictions should diminish as the pupil advances in school. The pupil should more and more be trusted on his honor. He should have increasing responsibility.

Parents should allow their children some money, with the suggestion that they spend it for some worthy end. They should be encouraged to save up their money for something worth while in the future. Let the boy save up money for a year for a bicycle. That means, give him a chance to earn enough for a wheel in a year; but if he succumbs to the temptation of the soda fountain and spends his money on the fleeting pleasures of the day, let him bear the punishment of being without a bicycle.

Give Harry freedom to visit his friend and spend his half holiday as he pleases, provided he comes home at the hour set and behaves as he should while away; but if he fails to meet these requirements, take away his freedom in this respect for a season.

Parental restraint should be removed very gradually, so that when the young man or woman leaves the protection of the parental roof, there is no appreciable increase in his freedom. There should be the corresponding increase in responsibility. Let the boy early keep his own clothing in shape and care for his own room. A little later, let him order his own clothes and pay for them from his own earnings. Doing the chores around the house has of old been the boy's portion, and there is good pedagogy in this arrangement.

By all means foster the young person's appreciation of the importance of a strong will, and teach the dignity of the free and loyal person.

Exercises

Prove the following propositions: —

1. The strongest desire is not always the motive we follow.
 2. It is hardest to keep the attention on our study the first few moments after some interesting diversion.
 3. Motive habits differ from instinct only in being acquired.
- Solve the following problems: —

4. One youngster held a heavy ax edge downward over a block of wood. Another child put his hand under the ax and said, "I dare you to cut off my finger." What happened?

5. Why is it so hard to do the right motions in the game, "Simon says, 'Thumbs up' "?

6. How are ideals chosen?

7. Illustrate by characters from history what is meant by a strong will.

CHAPTER XX

THE CREATION OF IDEALS

THE FAILURE OF ABSTRACT MORALITY

WE are saved by hero worship. Only by devotion to some person are our lives transformed from mere animalism to spirituality.

The Man of Abstract "Principles." — There is a certain very respectable sort of character which is based on nothing but abstract formulas. Such a character is a clever counterfeit, and passes current the world over; but when the real acid test is applied, he shows the baser metal. Take a narrow, stolid, cold soul to start with, one whose appetites and passions are not very strong, and whose feelings are not very sensitive. Take, that is, one of these comfortable little persons whose head has never bumped against the ceiling of environment, and give him a training that early fixes the grooves in his brain, so that his habits move like clockwork. Such a person will infallibly act according to conventional morality; but it is little more to his praise than correct time-keeping is to a watch. He is nothing but a machine. He acts as he does from mere habit. He has not soul enough to spoil. He does not lie or steal, because he has not the required moral courage or initiative.

For long stretches of everyday life, such a character

cannot be distinguished from the genuine article. But there are times that try men's souls. Then watch your man of "principle," whose principles are only a better sort of prejudices. He will not stand the test. He has no high and noble ideals. His morality is mere habit, and when justice demands that he shall leave his ruts he cannot obey.

Faith is the only basis for ideals. There is no such thing as devotion to abstractions. No person is devoted to "duty for duty's sake." We do not love Truth spelled with ever so big a capital. We love truthful persons. We are never the slaves of beauty, but we may be enthralled by the beautiful. What is mistaken for devotion to abstractions is often a mere set of habits.

Abstract Moral Training Poor Pedagogy.—It is this failure of the human mind to be moved by abstractions that gives rise to the problem of moral training in the school. Every now and then some well-meaning brother or sister rises up and demands that our schools teach morals. Texts on morals have been written, and Solonic legislatures have ordered that our teachers "shall teach honesty, truthfulness, chastity, industry," etc., to the end of the category. But it is difficult to see how text-and-recitation work in the virtues will improve the morality of our race. What is needed is life, not more knowledge; moral energy, not commandments. These advocates of the teaching of rules ought to read Paul's dissertation on this subject. His assertion that the law is impotent to save from sin is as good psychology as it is theology.

Of direct teaching of "morality" or ideals there

should be very little, if any. We all hate to be told to be good, for this is an insult to our common sense. Very few people, happily, need be told that industry, sobriety, mercy, justice, and the like are virtues; and that the vices are bad. I say "happily," for if a person is so lacking in moral sense that it is not self-evident to him that virtue is right and vice is wrong, a mere telling him that such is the case availeth not. He needs to *feel* that it is so. The trouble with the world is not the lack of *knowledge* of good and evil. What we need is the will and power to live lives consistent with our convictions.

The inculcation of ideals should be incidental. When, in history or literature, or in the daily incidents of the school, a moral question comes up, the true teacher goes on record with no uncertain sound. He always takes the broad, sympathetic, but also immutably honest and just attitude towards every question involving a moral issue. And he takes it with warmth. He is enthusiastic for the cause of God and humanity. He will inoculate his pupils with the same enthusiasm. They will catch the contagion of his ideals.

THE BEST METHOD OF MORAL INSTRUCTION

Sympathy and Example. — How can we implant these ideals in our pupils? How can we refine, broaden, and strengthen their ideals? Not by drill, not by increasing their knowledge, not by training their logical faculties, not by the study of moral philosophy. There is but one way, that is by sympathy and example. Only a human heart ever moves vitally a human heart. The first requisite, then, for the teacher

who wishes to develop character, is to have a strong and sympathetic soul. He must have the ideals he wishes to develop in others. These ideals must be triumphant in his own life. High ideals count for nothing if the person is fitfully ruled by passions and appetites. This strong, ideal-ruled soul must also be sympathetic. Now and then we find a really good man who is constitutionally cold and distant, and who for this reason can never be an inspiration. Such persons should not become teachers.

Every act is an influence for higher ideals when the soul is in possession of higher ideals and is faithful and sympathetic. Such a teacher cannot hide his light under a bushel. He may be forbidden to say one word on religion, he may never once in his teachings refer to the virtues, but he can no more help sowing and growing higher ideals in his pupils than the sun can help shining. Every look is a benediction; every word is instinct with the higher life of the spirit that uttered it. The spirit in which he meets opposition, the attitude he manifests toward the vital questions of humanity, the interest he takes in the welfare of his pupils, are so many ways by which the nobility of the soul of the teacher stands forth and awakens nobility in the pupils in response.

The Need of Individual Work. — To awaken ideals for the higher life, individual work is the most fruitful. We cannot save men wholesale; it is a retail business. The soul of finer grain shrinks from laying bare its holy of holies in a crowd. If you want to get at the inmost being of your pupil, — and you do want this if you intend to help him to greater ideals, — you

must be alone with him. To administer properly this sacrament of soul communion, is not a grace given unto all teachers, and for some to attempt it were sacrilege; but many can attain this art, and no attainment is greater.

If I were a bishop about to ordain a class of men for the ministry, this is what I would say: Preach and pray and teach by all means whenever you have an opportunity; but don't expect to save the world that way. Remember that the world is perishing for the want of individual work. There is probably not one person out of a thousand who is not longing, consciously or unconsciously, for some stronger and wiser soul with whom he might be intimate, and with whom he could share his hopes, his fears, his worries, and aspirations. But this intimate soul sharing is sacred work; would to God that you were struck dead the moment you approach it with unclean hands! Never do you need to feel the presence of God more clearly and more truly than when you have but one listener and you are communing with his inmost soul.

The adolescent needs especially a confidential adviser and leader, not only in questions touching sexual subjects, but for the whole new realm of his increased spiritual life. Don't say that this is the duty of the parents. You know, as a matter of fact, most parents are not the confidants of their half-grown and grown children. Many are not fit to be anybody's confidants. Many more have an unconquerable aversion against intruding on the privacy of their children's inner life. Most important of all in this connection is to notice that with very many adolescents the persons they last

of all would make their confidants are their parents. They may love their parents immensely; they may feel perfectly free and easy in their company — but to confide to them the inmost soul — no, they cannot. Honestly, now, wasn't that *your* experience? If you made a confidant of any one on the subject of your personal religion or love, was this confidant one of your parents?

THE CULTIVATION OF HIGH IDEALS

And how may the teacher best become this spiritual adviser and leader? Simply by embodying in his own life the ideals he wishes to develop in his pupils.

Emphasize that which is noble and refined in your nature. Be on the alert to give your higher self every opportunity for expression.

Be true to your ideals. Do not let your life be a patchwork of devotion to what you deem noblest, and base surrender to appetite and desire.

Be consistent. Don't, as Professor James says, try to run several conflicting selves at once. Take your ideals with you, and the same ideals, and live up to them when at home or abroad, at work and in vacation.

Do. Never feel satisfied with mere feeling. Put every ideal into action at the earliest possible opportunity; and don't wait for the opportunity, but make it. The world is full of fine worthless fellows, who think entrancing thoughts and fairly gush with the noblest sentiments, who are so busy admiring their stock of ideals that they never get around to doing anything.

Seek the society and confidence of those whose ideals are higher than your own. Two coals burn better than one.

Settle the religious question for yourself and live up to the settlement. This question of ideals is essentially a religious one, and indifference to religion is incompatible with high and true ideals.

Exercises

1. Try to find a man in history who preached only an abstract moral philosophy whose moral influence has been equal to that of St. Bernard, St. Francis, or John Wesley.
2. Think of some case in your own experience of some one who was saved by hero worship.
3. Think of some one who was ruined by hero worship.

CHAPTER XXI

CHARACTER

THE supreme object of life is the formation of the right kind of character. Character is determined by the fixation of the motives. Hence a study of character is a review from the standpoint of morals of what we have studied about motives.

ELEMENTS OF A WELL-DEVELOPED CHARACTER

Self-control. — The virtue of the impulses is *self-control*. The person of good character is master of himself. In the huge welter of impulses and emotions, desires, inclinations, and instincts we have the power to choose some to be realized and leave others. The well-born and well-educated person has his desires, instincts, and appetites well balanced and proportioned. He follows the Greek motto, "Measure in all things."

Systematized Habits. — The virtue of the habits is *system*. By all means, systematize life. Nothing adds to the efficiency of life more than well-ordered habits. The strong, well-developed character has a corps of efficient habits, thoroughly trained and organized to do its bidding.

But like most other good things, habits are good servants but poor masters. The person who is absolutely under the control of the habits of thought and

action which he has adopted can make no progress, can accomplish no mental growth.

Breadth and Refinement of Ideals. — The virtues of the ideals are several. The rational interests or ideals of a good character must be *adequate, noble, and refined*; and, to have all these characteristics, our ideals must be the product of a certain evolution. They ought to broaden with the years and add layer over layer of wider interests. One's ideal should be to live in true harmony with all conscious beings, and to further by one's life the true happiness of all persons. But it is not enough that our ideals be broad and unselfish. They should also be noble and refined. The converted slave who prayed that his fellow men might have all the tobacco they wanted to smoke, was an unselfish and kind-hearted soul; but his conceptions of ideal humanity were not very lofty or refined. No mechanical and external graduated scale can be given for nobility of ideals, for the scale itself is growing. Our notions of what is refined differ even from those our fathers had. This is because the ethical ideal of every civilization is a living, growing affair. Every age approximates the perfect ideal, and the ethical progress consists in getting nearer to this highest ideal. Our faith is, therefore, that healthy, well-balanced persons in healthy, well-balanced ages and communities are continually approximating more and more nearly to the absolute ideal as it exists in the Divine Mind.

Strength of Will. — The virtue of the will is *strength*. How strong should the will be? Strong enough to keep us true to our rational interests. The man of

strong character follows his ideals, not his impulses or desires. An ideal may be defined as a *chosen goal for action*. The question of the freedom of the will is one that cannot be touched here; and the expression "rational freedom" of the will is not always used with the same meaning; but when a person has conquered his impulses and desires so perfectly that he always does what his reason tells him is best, despite his momentary passions and appetites, his will may be said to have acquired its rational freedom. He has ideals and is true to them.

He who is rationally free has the same desires and instincts as other men, *but he is not ruled by them*. His ideals are supreme. Every voluntary act or thought of his is directed to the end he has chosen. This presupposes that he *has* chosen an end. His life is rationalized. He has something to live for. He does not follow the direction of the push and pull of momentary and ever shifting desire and instinct, but he controls indirectly even his desires, appetites, and passions. He is indeed a *free man*!

SUMMARY

The well-developed character, then, has the following attributes:—

Impulses normal and natural, refined and under control of the will.

Habits of virtue, industry, work, order, and optimism perfectly formed; but slavery to no habit.

Emotions refined, sensitive, and strong, but under control of the will.

Ideals supreme over all, unselfish, adequate, true to the highest standards of our civilization and living; and hence growing and constantly approximating the absolute ideal.

A Will that holds impulses, feelings, and habits subordinate to the chosen ideals.

(C). Subconsciousness

CHAPTER XXII

THE SUBCONSCIOUS LIFE

THE FIELD OF CONSCIOUSNESS

As we have already noticed there is a single force — consciousness — which is operative in the highest and lowest processes of the human organism. The fundamental characteristic of consciousness, its power of concentration, we have studied at length under *attention*. We are vividly conscious, fully alive, to only one aspect of one topic of thought at once; all the rest of the field of consciousness shades off rapidly from this central point of light into the penumbra and twilight of partial consciousness. This surrounding twilight of half thought is called *subconsciousness*, or, as it has been well named by Professor James, the “fringe” of thought.

Thus we may arbitrarily divide the field of consciousness into clear consciousness and subconsciousness. In the same way we may recognize all degrees of subconsciousness, from what is almost complete consciousness to the absolute night of unconsciousness. Although, for instance, we have no smallest inkling of consciousness in the action of the lymphatic glands, still they seem to be vitally and directly connected with our

consciousness, so that it seems best to consider that such purely physiological functions share in consciousness, though so infinitesimally that we cannot directly recognize it.

Characteristics of Subconsciousness. — All the vital functions, the whole physiological machinery, is operated by our subconsciousness. The building and tearing down of cells, the secretion of the glands, digestion, respiration, the circulation of the blood — all are carried on by the subconscious vital force, which not only supplies the energy, but also furnishes the plan or model which then is incarnate in the flesh. This is deep down in subconsciousness, and nothing of it ever comes even into the partial twilight where conscious observation is possible.

Many bodily functions come much higher up in consciousness. Thus, within certain limits, we can breathe or stop breathing as we please. Sneezing, hunger, thirst, fatigue, rise out of the subconscious gloom into clear consciousness and tell us of the condition of the bodily organs. But they are still in origin and control subconscious.

THE TENDENCY TO REACT

Reaction to Stimuli. — All consciousness responds to stimulation. This, as we have seen, is one of its fundamental characteristics, from the highest reason to the lowest subconscious vital force. It is responsive. Thus a lofty ideal stimulates the hero to action. A straw tickling the breast of the headless frog will be responded to by the brushing motion of a foreleg. The presence of a liquid in the mouth of a sleeping person

will make him swallow. Lack of oxygen in the blood will produce a yawn. A doleful thought will make the tears start. The appreciation of the ludicrous will start a smile. A savory odor when one is hungry will make the mouth "water." A soft answer turneth away wrath. The small boy itches to spoil the dude's hat with a snowball. A difficult mathematical problem stimulates the thinker to try to solve it.

Responsiveness to Suggestion. — Responsiveness to suggestion is really one type of reaction to stimulus, but it needs a special treatment. A fundamental characteristic of consciousness is its striving to make real whatever is presented to it ideally, that is, pictured to it. Consciousness is ever busy *realizing the ideal*. Thus when I wish to take my watch from my pocket to see what time it is, I simply imagine myself doing just this, then let myself go, and it is done. Hence, if a person does not restrain himself, he does whatever he imagines. A child telling a story invariably acts it out; not because it is anxious to make the story plain to its auditors, but simply because its imagination of these actions suggests them to the motor centers, and the dramatic rendering is the natural result. If we do not consciously inhibit the action, we beat time with foot or head to the music we hear, because the rhythm suggests these movements. Nervous people feel a strong impulse to throw themselves over precipices when standing on the brink. They cannot help imagining very forcibly how awful a tragedy it would be to fall over the precipice. This imagination of the act of the tragedy acts as a suggestion to the mind, and it has a strong impulse to make this image real.

All consciousness, whether clear or subconscious, responds to suggestion, but our clear consciousness has the power of inhibiting the response to suggestions, while our subconsciousness has not the power to inhibit this response. It will respond with fatalistic certainty to every suggestion that reaches it. Hence the importance of guarding our subconsciousness from wrong suggestions.

Subconscious Reactions. — *Subconsciousness acts solely in response to stimulus and suggestion.* The physiological machinery seems to be self-exciting. The lack of oxygen in the blood in the lungs stimulates the chest to expansion. Emptiness of the digestive organs produces hunger. A lesion stimulates the phagocytes to congregate.

External or physical stimulus, that is, stimulus from other material agents not of the organism itself, has great influence on the subconscious mind. To this belong all the effects of drugs, food, heat, cold, wounds, and, in general, the contact with the rest of the universe.

But a vast and undefined region is yet left for suggestion. Subconsciousness takes its orders regularly from above, from clear consciousness. Every state of clear consciousness acts as a suggestion to subconsciousness. All that we consciously think, feel, and do sifts down to the subconscious and colors it. Our subconsciousness is constantly saturated with the suggestion derived from our conscious life.

Cumulative Effect of Suggestion. — Merely thinking once, "I will soon die," will not kill you. But repeating this thought day after day, hour after hour, allowing it to depress your spirits and influence your conscious

actions, this will surely be very detrimental to your health, and may shorten your life.

The subconscious mind is the *repository* for the products of the conscious activity of the mind. Every thought, every feeling, every act leaves its impression on our minds. Each individual mental event leaves behind itself an influence, light and fragile as a gossamer thread, but still a filament that tends to bind us faster to some conviction, attitude, character, morality, or immorality. But though the influence of each act of the mind may be frail as a spider's web, the united power of a long-continued course of action becomes strong as iron bands. We are daily hammering out our own character and destiny, and though we are every minute free to act as we choose, the accumulated result leads us whithersoever it will. It has become a Fate.

THE STREAM OF THOUGHT

From out the mysterious depths of the subconscious there wells up constantly into our full consciousness a spring of thoughts, feelings, and impulses, colored already by our dominant mood. The nature of this stream of emotions, aspirations, appetites, and moods is determined by the nature of our subconsciousness. And this subconsciousness is, in its turn, determined by the sum total of the suggestions we have sunk into it from our conscious mental life.

This stream, then, that takes its rise from this spring from subconsciousness flows across the brief field of clear consciousness to be again lost in the deepening shades of subconsciousness. Here it acts as a suggestion for the future to the subconscious.

Character of this Stream of Thought dependent on Ourselves. — If this stream were an affair of fate so that we could in nowise change its nature, then this whole study were interesting, perhaps, but certainly impractical. But we *can* change the nature of the stream of thought and feeling in full consciousness. By using our voluntary attention we can suppress any thought at will, and substitute another for it. We cannot directly change our feelings, but we can suppress the expression of the undesirable feelings, and then they will soon vanish, and we can cultivate and emphasize the expression of virile, optimistic feelings, and thereby strengthen such feelings. Thus the right suggestions will be given to the subconscious, and in time the waters from its spring will be sweet.

EFFECT OF SUBCONSCIOUS LIFE UPON HEALTH AND CHARACTER

The suggestions of our conscious life to our subconsciousness make or ruin health and character. "As a man thinketh, so is he," comes very near being an absolute scientific truth. He who thinks, acts, and feels health, vigor, triumph, and harmony will be healthy, vigorous, successful, happy. Causes external to him may sometimes mar the perfection of this result, but he is certainly always much happier, healthier, and more successful than he would have been if he had given repining, regret, and dejection a place in his life. Conversely, it is almost certain that timorous, cowardly souls who always fear that sorrow, sickness, and disaster are to overtake them, who always look on the dark side of life, will be in poor health, be unfortunate in

their work, and, in general, be failures. *It shall be unto thee according to thy faith.*

Many, however, object to this view. Many a famous worrier, they contend, enjoys good health and a long life, and often misfortune overtakes us where we certainly had never invited it by expecting it.

In answer, it may be pointed out that much of the worry of the professional worrier is only skin deep and covers a soul that at bottom is quite optimistic and confident of the future. Then it is to be noticed that nature is patient and long-suffering in this department as well as in all others. It is wonderful what amount of abuse human nature will stand before it is ruined. Then it should not be forgotten, that this theory does not try to explain everything by suggestion. In order to break one's leg in a railway accident, it is not at all necessary or even possible to have brought it on by autosuggestion.

The subconscious does not understand a negative. The suggestion to the subconsciousness is furnished by the *image before the mind*. To imagine something undesirable, and then say to one's self, "I will not do that," does not destroy the evil suggestion. As far as suggestion goes, it is just as bad to think, "I have not consumption," as to think, "I have consumption," for the mental image is the same in both cases. Of course, the grammatical form does not matter; the image in the mind is the only important affair. This image should always be cheerful, optimistic, tonic.

Effect of the Morbid. — The mind finds an unhealthy enjoyment in reveling in the details of crime and suffering. Hence, detailed accounts of murders, executions,

accidents, misfortunes, and other horrors are a prominent feature in the daily press. Children love ghost stories, and silly nurses' tales of the bogey man are listened to with horrified interest. A friend of mine tells me that in his childhood he used to sit on the edge of the bed and listen to ghost stories until he was afraid the ghost might come in the dark under the bed and grab his legs. But he could not choose but hear. This kind of suggestion to the subconscious is very harmful, especially to the young.

Effect of the Indecent. — Young people, especially boys, are tempted to indulge in stories, thoughts, and fancies that border more or less closely on the indecent. They should remember that the soul, especially its subconscious phase, is like a sheet of white paper, and that every base suggestion is like a rub by a grimy hand on this paper. There are soul erasers, happily, and the marks may be rubbed out, but the unsullied purity of the days before the grime, cannot be restored. The soul, like the paper, retains some trace of the soil.

Protection against Evil Suggestions. — We should shun all imagination of evil and wrong, for thus by evil thoughts and wrong ideas we store up iniquity for ourselves in subconsciousness. Here, however, we run up against a practical difficulty. It is impossible to do one's duty in this world without witnessing, knowing, and thinking about much that is evil, ugly, and sad. The teacher must hear and read libraries of bad grammar and illogical thought. The doctor spends his time with sickness and death. The lawyer deals with wrongs of all kinds, and gets very familiar with the seamy side of life. Besides, every intelligent person

must know something about history and contemporary life, and how full is not this with ignorance, vice, and crime?

In solution of this problem, this may be said: First, an antidote should be taken against this necessary evil. Let the teacher read some classical literature every day, to take the taint of school compositions out of his system. Let the doctor, the lawyer, and the business man choose some line of ideal pursuit as far as possible away from the prosaic side of their callings, and devote some time every day to this line of work, to act as an antidote to the carking cares, the souring or fossilizing influences of their business upon their subconsciousnesses. Literature, some university extension study, gardening, amateur photography, painting, music, the study of birds through an opera glass, are some suggestions of such ideal occupations. Thus Stedman was a banker and a poet, and Gladstone was a statesman, a Homeric scholar, and a theologian.

But the most important thing to remember about our undesirable experiences is that to a very great extent the impression that they will make upon the subconscious self depends upon our own attitude. A duck may be in the water all day, and still never a drop touches the skin protected by feathers. Likewise, if we do not with morbid sympathy fondle the evil and the untoward that necessarily meet us in life, very little will penetrate to our deeper self. The teacher thinks vividly of the right forms when he corrects exercises. Hence these, upon which he puts his sympathetic emphasis, get recorded in subconsciousness and not the wrong forms which he is correcting. The

doctor ought to picture with emotional vigor the condition in which he wishes his patients, in beauty, health, strength. The man of affairs should ever have vividly before his mind's eye his ideal human character, and his ideal of business, so that this ideal is daily the most real element of his experience, and daily fills his subconsciousness more completely.

When you have to think of yourself as sick or as being in danger of becoming ill, always do this with as little emotion as possible. Let the thought stay in the superficial, rational part of your mind. Think of it as you would a problem in chess, — without any feeling. And think, in any manner, as little as possible of sickness. When ill, imagine as vividly as possible the condition you wish to be in. Think of the health which you should have, not disease which you actually but accidentally and irrationally have. These cheerful, optimistic, health-inspiring thoughts and feelings will direct the subconscious self into the right channel. You will thus convince the subconscious self that you have a right to be well and that you have the power to get well, yes, that it is a sin to be ill.

The Correct Attitude of Mind. — *Do not capitulate to the sordid.* This is a brave, grand universe, just as near paradise as we think it. In a very fundamental sense *we make our own world*. Almost every person lives in his youth for a while in Arcadia. He has ideals. He is filled with noble aspirations. He bubbles over with ambition. Life is supremely worth while: this is his daily mood.

This is the correct attitude in which to live. This atmosphere of enthusiasm, optimism, ambition, aspira-

tion, and hope should constantly surround us. This is the true fountain of youth. And this fountain may be made perpetual. One of the saddest heresies of life is the prevalent belief that it is necessary, nay, desirable, to lose the buoyancy of youth soon after the teens are past, or at least when the thirties are over. I fear that it is true that most middle-aged and elderly people plod through life. They just do — their — duty — every — day without joy, without sorrow, without looking forward to anything better than a little rest or recreation now and then. They take no delight in their work. In the morning they greet the new day with a sigh of resignation, and they welcome the end of the workday with another sigh of relief. They are down at the three-square-meals-a-day and daily-stint-of-work basis of life. If they are weak, they look fagged; if they are sensitive, they look frazzled; if blunt, they look apathetic and woodeny; if strong, they look prosy and sordid.

This should not be so! This is the wrong attitude towards life. Its cause is very natural. Life's duties overwhelm us. We become weary under the "eternal grind." From sheer inertia we slip into the plodding attitude. At once a current of suggestion sets in to the subconscious: "The world is mean, sordid, shabby, tiresome, burdensome; let us plod on since we have to." Soon we are confirmed in this attitude.

Cultivate an optimistic spirit. Have faith in yourself. Measured one way, you are infinite, divine. As long as you act in harmony with the universe, you are invincible. There is a wealth of truth in Sam W. Foss's poem where he lets a "lunkhead" relate how he

and other "lunkheads" grew up together "like cornstalks in the same hill," but that while the relator is still an undistinguished countryman, some of his comrades have reached the highest pinnacles of success.

"For I stayed home and rassled in the cornfiel' like a chump,
 Coz I knew I was a lunkhead and a lummox and a gump;
 But if on'y I hadn't known it, like them other fellers there,
 To-day I might be settin' in the presidential chair.
 We all are lunkheads — don't git mad — an' lummoxes an'
 gawks;
 But us poor chaps who know we be — we walk in humble
 walks.
 So I say to all good lunkheads, Keep your own selves in the
 dark;
 Don't own or reckernize the fact, an' you will make yer mark."

SUGGESTIVE POWER OF THOUGHTS AND FEELINGS OF OTHERS

Expressed Thoughts and Feelings. — The expressed thoughts and feelings of others act as suggestions upon our subconsciousness. When we listen to speech, we picture in our minds what is said. Every image in our consciousness becomes a suggestion to the subconscious. So this is only another form of autosuggestion. Physicians and nurses experience a horrible wear and tear from constantly witnessing misery and pain. In self-defense, the mind builds up a sort of wall or protection against these constant suggestions of pessimism. People that see a great deal of misery become, as we say, hardened to it. This, however, is an expensive way of defense, for this is the same process of "sordidifying" which we have just condemned.

Unexpressed Thoughts and Feelings. — Whether or not the unexpressed thoughts and feelings of other persons influence subconsciousness is at present a debatable borderland in psychology. There is, however, a mass of evidence which seems to lend itself most naturally to such an interpretation. Most people believe that by looking intently at the back of a person and wishing hard that he may turn around we may get him to do so. "Absent treatment" is given by various schools of mental healing, and there the thoughts and volitions of a person not in the presence of the sick person are supposed to effect a cure. Until a comparatively recent period it was a crime (treason) in England "to imagine the death of the king." To be sure, this had to be something more than mere imagining, but the historical essence of the crime lay in the belief that such imagining had a baleful influence on the king's health. The witch of old used to make images of wax of the persons she wished to harm and then maltreat these images as she wished the real persons to be treated. As the image wasted away, the person represented was supposed to waste away. Believers in the occult hold that every person has a spiritual "atmosphere" about himself, and that all who come within his influence are more or less affected by it.

If there be such an extrasensual exchange of influence between minds, it is probable that proximity in space facilitates its transmission. But the space relation is by no means the most important. Positive, aggressive, self-contained characters are in less danger of being disturbed by such influence, and even when

they seek it, they will probably find it hard to get a clear conscious experience. But the subconscious influence is still there. The negative, the passive, the hypersensitive, the neurotic, the plastic minds are more likely to be consciously the recipients of such influence. This does not mean, however, that the ability to be conscious of such influence must necessarily mean mental disease or imperfection of character.

The Spiritual Atmosphere. — That we are constantly in spiritual company is the doctrine of all religions. To complement this theory we might add that if we believe in a spirit existence at all as distinct from the body, we cannot suppose the mind to be limited by space. There is a communion of sinners as well as of saints, even while in the body, according to this theory. All lovers and mothers believe or try to believe that though thousands of miles away from their beloved, still they are with them *in spirit*, actually influencing, comforting, leading, and being led by them. According to this faith, which we all try to hold to some extent at least in every great crisis of life, we are always in the company of our spiritual relations. Those who are dear to us are always near us in the most essential sense in the world.

This doctrine on a grand scale is put beautifully and powerfully by Lowell in his "Present Crisis":—

When a deed is done for freedom, through the broad earth's
 acting breast
 Runs a thrill of joy prophetic, trembling on from east to west;
 And the slave, where'er he cowers, feels the soul within him
 climb

To the awful verge of manhood, as the energy sublime
Of a century bursts full-blossomed on the thorny stem of time.

Through the walls of hut and palace shoots the instantaneous
throe,

When the travail of the Ages wrings earth's system to and fro;
At the birth of each new Era, with a recognizing start,
Nation wildly looks at nation, standing with mute lips apart,
And glad Truth's yet mightier man-child leaps beneath the
Future's heart.

So the Evil's triumph sendeth, with a terror and a chill,
Under continent to continent, the sense of coming ill,
And the slave where'er he cowers, feels his sympathies with God
In hot tear drops ebbing earthward, to be drunk up by the sod,
Till a corpse crows round unburied, delving in the nobler clod.

For mankind are one in spirit, and an instinct bears along,
Round the earth's electric circle, the swift flash of right or
wrong;

Whether conscious or unconscious, yet Humanity's vast frame
Through its ocean-sundered fibers feels the gush of joy or
shame,—

In the gain or loss of one race all the rest have equal claim.

This doctrine teaches emphatically that soul communes with soul even without and beyond the use of the senses; and that hence the importance of a deed is not measured by its effect in the sense world.

This theory makes the complexion of our secret thinking and brooding literally terribly important. Our thoughts, moods, and imaginings, if base and morbid, will sink us into low and wicked spiritual company, and from this company we shall constantly receive debasing suggestions which will fill our subconsciousness with filth and wickedness. But if we keep our souls in lofty spiritual regions, if we dwell in

the Upper Room, if we think, feel, imagine, and enjoy those things that are pure and wholesome, our souls shall even now enjoy heavenly company, and from this cloud of noble spirit companions we shall constantly receive suggestions that strengthen us against temptation, guide us in doubt, hearten us in dismay, and give us victory in our battles. Conversely, an unexpressed thought, if evil, will make the path of virtue and life harder to walk for every human being; while if good and noble, it will to some extent elevate the whole human race.

SUMMARY

Practical Conclusions about Subconsciousness.—That part of our being of which we are conscious is only a very small part of us. In cases of sudden reformation it is still fearfully possible that the subconscious mind is pursuing the downward road, however respectable the conscious life may be. Every act, every thought, every emotion adds something to our subconscious self, and thus our subconscious life represents the accumulated momentum of our past. Our subconscious life gives depth and body to our conscious thoughts and emotions. It is, therefore, impossible for one who has lived a thoughtless and frivolous life to feel very deeply or think very powerfully on any subject on any occasion, even when he is stirred to the bottom of his being. He is *shallow*, that's why. To him who secretly dallies with filthy thoughts it becomes impossible to keep a single subject in his mental possession unsullied. He who is an opportunist in the trifles of daily life, who is insincere habitu-

ally in small things, will find that he has no fund of moral courage to draw from even when at some crisis in his life he earnestly desires to play the man. The yellow streak in character does not come down upon the unfortunate one, like the potato blight, in a night. Silently and imperceptibly flake after flake of the yellow rust fastened itself upon the soul as the result of infinitesimal cowardices, petty insincerities, trifles of indulgence, and traces of selfishness. In short, life is one and inseparable. It has a fatal integrity. We cannot serve God and mammon.

Our subconscious self connects with the whole universe of being. To speak in theological language, we can draw upon the strength and power of God through faith. Deep down in the foundation of our being we are one with the great Consciousness of the world. That is why we have an exhaustless spring to dip from, and that is why "all things are possible for him that believeth."

The Proper Attitude towards Life. — Our subconsciousness is the bar of soft iron, surrounded by the induction coil. Our conscious life is the current of electricity that induces (suggests) magnetism to the bar and makes it capable of attracting by magnetic force. Here the similarity ceases, for while there is but one kind of electricity, there are many kinds of suggestion. The nature of that current of conscious life lived, so to speak, on the outside of us in the induction coil, determines the nature of our inner subconscious life, out of which are the issues of life as to health of both body and soul. It becomes, then, supremely important that we have the right attitude toward life,

for it is this attitude that acts as a suggestion to our subconsciousness.

Our attitude should be that of optimism, hope, of a triumphant, forward-march mood. Our imagination should constantly be filled with bright, happy, harmonious images. We should resolutely shut the door to fear, distrust, moody brooding on what might have been, as well as all morbid thoughts of the details of crime and disaster and misery. Anger, hate, and jealousy should be resolutely banished. Every sensible person must take the possibility of failure into account when he is planning any course of action. *But when once our course of action is determined upon*, we should never dwell further upon the possibility of failure. No ignoble, impure, or sordid thought should ever be harbored.

The Physical Attitude. — Our mental attitude is intimately dependent on the position and condition of the body. We should therefore keep the body in the position which expresses the thoughts and feelings recommended above. One little phrase of two words gives the essence of all that belongs to a correct bodily carriage. It is: *Chest up*. Unless there is very good reason for it, it is impossible to feel downhearted and dejected with the "chest up." Brisk, vigorous movements and lungs well filled with oxygen are also important. This is an almost perfect and complete rule of physical carriage. Express as vigorously as possible by the body, its action and carriage, a tonic, virile, and healthy frame of mind.

Pedagogical Observations. — The schoolroom should be permeated by a brisk, breezy, tonic mental atmos-

phere. Teachers and pupils should find joy in their work. Nothing morbid or depressing should be found in books for children. In teaching physiology and hygiene, the healthy and normal conditions and functions of the body should be dwelt on, not the abnormal and diseased.

In Conclusion. — “ Finally, brethren, whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, **THINK ON THESE THINGS.**” Phil. iv: 8.

Exercises

1. What is the effect on subconsciousness of much reading of trashy novels?
2. What is the effect of constant association, as in an asylum, with the insane and with imbeciles?
3. What is the value of starting the day with a deeply felt devotional exercise?
4. What should you think of just before you fall asleep?
5. What effect did the fine specimens of the arts of architecture and sculpture have upon the children who grew up in classical Athens?
6. Draw a diagram representing the relation of the conscious mind and the subconscious mind.
7. Illustrate by some character from history the unconscious tuition of war.

(D). Child Study

CHAPTER XXIII

CHILDHOOD

VALUE OF CHILD STUDY TO THE TEACHER

MAN is a living organism, not a mechanism. Mechanisms are built from without; organisms grow from within. Therefore, to get a living knowledge of an organism, one must know its history. We do not know the oak until we know how it develops from the acorn. We do not understand a nation until we are acquainted with its history. For the same reason, if we are to understand the mind, human nature, we must study its growth. Since man is a living organism, a study of the history of the individual's development is essential to a true perspective of psychology.

Child Study.—The study of the evolution of the human individual is, therefore, the necessary foundation of all valid pedagogy. But of all the voluminous writings of educators and investigators on this subject, what is of value for our purpose can be summarized in a few pages. In the two following chapters, we shall try to place before the reader as tersely and succinctly as possible a few of the results of child study which are most applicable to this discussion.

THE PERIODS IN THE EVOLUTION OF THE MIND

There are four well-marked periods in the evolution of the human individual: *childhood*, *early adolescence*, *youth*, and *maturity*.

Of these the first is the subject of this chapter. This may be subdivided into two periods.

THE TWO AGES OF CHILDHOOD

About the age of eight or nine, when children cut their permanent teeth, there is a time of rather rapid change which separates childhood quite definitely into two divisions, which we may call *early* and *later* childhood.

In early childhood perhaps the most striking characteristic of children is their *timidity*, and well it is that nature has thus guarded them; for they are surrounded by danger on all sides, with which their weakness and ignorance is far from able to cope. A prominent intellectual peculiarity of this period is the frequent inability to *distinguish reality from imagination*. Very often the reputation of children for fibbing is entirely undeserved. They are simply unable to distinguish the products of their imagination from the percepts of the senses. Thus many children have imaginary playmates to whom they get as attached as to real flesh-and-blood comrades.

In later childhood these characteristics are lost, and the love for adventure and braggadocio becomes very apparent in boys, a characteristic which has caused this period to be called the "Big Injun" period. With girls the homing and maternal instincts begin to

be manifest at this time. The period from about ten to fourteen years is a period of slow growth. As little energy is spent in growing, the child can spend all his vitality for "current expenses." Hence he is now capable of doing hard work without injury. This is the drill period in education. Now let him get the main part of the mechanical element in school work.

THE CHILD NOT A MINIATURE OF THE ADULT

Primers used to contain material of interest to grown people, put into simple language. If polysyllables were avoided, it was thought that children certainly would thrive on an exposition of the English constitution, the theory of the atonement, or manners at the table. But child study has taught us that the child has a mental life altogether his own. If we wish to influence it, we must first know it.

Child World the World of the Senses. — The world as it exists to the child is largely the concrete, tangible world of the senses. One step beyond the senses is all the wise teacher of children will venture. Objects, models, pictures, vivid descriptions — stop there. If you venture farther away from the actual, you will leave your juvenile charge behind.

HOW CHILDREN THINK

Our past experience is our thinking tool. Just as a gardener digs with a spade, so the thinker thinks with his past knowledge.

The Child's Small Store of Associations. — Children have not experienced much, and hence have only a very small store of knowledge to draw upon. For this

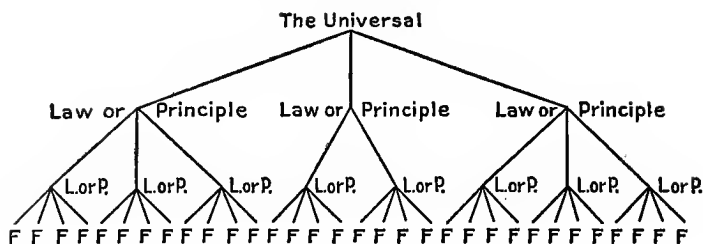
reason, their thoughts differ from those of the adult. For example, you and a child of six meet a funeral procession. As soon as the scene stimulates your senses, up spring your very complex and powerful associations relating to funerals and take charge of your mind. Some personal bereavement perchance presents itself; pictures and emotions you have acquired by reading of death and the grave awake within you. Your theories concerning death and the life beyond come back to you. Religious sentiments and thoughts give color and tone to the whole.

And the child? Why, bless his heart, that funny black carriage with plumes and glass sides, in the midst of such a line of vehicles, reminds him of the aquarium in last summer's circus parade.

Hence, before the teacher can teach his class to do better thinking, he must know how they think *now*, and before he can know how they think *now*, he must know the children's minds.

The Three Kinds of Thinking. — To understand how children think we must begin quite a distance back.

The diagram on page 224 is a representation of the intellectual universe. At the materialistic end, or rather, bottom, we have facts—events, objects, things. These are combined, subsumed, under laws or principles that express their essence, their meaning. These laws again are united under higher, more universal principles, until, as we believe, the lines of the whole universe converge to one point. Now, thinking consists in climbing these intellectual ladders; either up from fact to law, or down from law to fact.



But it must not be forgotten that this "climbing" is a complex performance in which both the habits of ancestry and the spontaneous creative elements supplied by the individual "climber" are ever present.

There are two ways of thinking, explicitly and implicitly. Examples of these two methods are given below. Which is your way?

(a) "I have eaten several Bartlett pears. They are all excellent. Hence I infer the law: All Bartlett pears are excellent. This is a Bartlett pear. It must be excellent."

(b) "I have eaten several Bartlett pears, and liked them. Hence, this being a Bartlett pear, I guess it must be good."

For cases like the above, I use the second way every time. It is shorter, and it is satisfactory. It differs from the first in apparently leaving out all reference to a law and in jumping directly from one fact to another. In reality, however, we do have a glimmer of the law, even in the second process. But the reference is implicit. We do think of the law, but we do not consciously abstract it from the facts in which we see it exemplified.

Most of our thinking is of this class. In our daily

life our mind skips nimbly from fact to fact, and passes through the intervening law without alighting on it. In practical thinking, the mind's eye is riveted on things, facts, and has not time to focus itself on the principles that it employs.

The next higher grade of thinking is scientific thinking. When the botanist classifies plants; when the student of plant ecology sees and formulates the relation that exists between insects and flowers, or between humidity and foliage surface; when the student of political economy discovers the essence of free government or the economist speaks of the principle of free competition: then these thinkers have laws and principles *explicitly* in their minds. This may be called scientific thinking, or explicit reasoning.

There is a still higher phase of thinking. When the mind seeks fundamental truth, the great unifying principles that explain all laws, it is engaged in philosophic thought. Very few people are capable of this kind of thinking.

We have, then, three kinds of thinking: —

(a) *Common thinking*, which consists in reasoning from fact to fact without formulating the principle or law upon which the reasoning depends.

(b) *Scientific thinking*, in which laws, principles, and relations are thought out explicitly.

(c) *Philosophic thinking*, in which the mind seeks fundamental, unifying principles.

Children's Thinking Unscientific. — Normally, children do not think out laws, principles, and relations explicitly. Ideas and images never tarry long before the child's mental vision. There is a change of scene on

the stage of thought every few seconds. Naturally they use exclusively the first kind of thinking. Formal abstractions, generalizations, and deductions are anti-natural to the child. Definitions committed to memory are to him not definitions at all; they are but husks, shells, and are correspondingly unpalatable and indigestible.

Hence formal grammar and the *science* of arithmetic have no place in the first six or seven grades of our schools. This will be more thoroughly discussed later. We shall now restrict ourselves to the answering of a few current objections.

The first objectors are the preternaturally bright teachers. "Why," these object, "I can make children comprehend the reason for every rule in arithmetic, and I know they are interested and like it."

I would answer: So they do—for the moment. Why? Because, with your marvelous social powers, you have hypnotized the children into doing what is not healthful or natural for them to do. Still, they seldom like the subject, even then. They like *you* and your bright, breezy ways, not the subject. Then, notice how quickly they lose what they get in your training! Healthy children have a happy faculty for shedding abnormal accomplishments.

Next comes the young trained thinker. "But, sir," he objects, "is not all education artificial? We want the child to develop more completely and faster than he would naturally if left without schooling." True, but this artificial stimulation should not be antinatural. And so, to require children to do scientific thinking, to learn definitions, to use and state universal prin-

ciples, to have laws and relations *explicitly* in mind when reasoning, is at best a waste of time and energy on the part of both teacher and pupil, and is often a source of serious injury to the growing mind.

THE CHILD'S IMPULSIVE AND EMOTIONAL LIFE

Child swayed by Present Impulse. — Holmes somewhere says sarcastically that the Indian of the novel is "merely a bundle of instincts on legs." This is the literal truth when said of children. Throughout childhood the *impulse of the moment* is by far the greatest factor in determining action. Ignorance of this truth is responsible for much injustice. In nine cases out of ten, your bad boy never *planned* his wicked prank at all. The opportunity offered itself; the impulse seized him; it was done: there is the whole story. Of course, plans and deliberations become more frequent and more extended as the child grows older; the boy of twelve years schemes more than the child of two; but still, characters like Peck's "Bad Boy" are a libel on childhood. Real boys are not so long-headed. Equally impossible is the creation of the imagination that did duty as the Good Little Boy of the Sunday-school book. Observe, I do not assert that the wickedness or holiness *per se* of these characters is impossible in children, but I do claim that the grown-up premeditation and speculation attributed to these characters is impossible in normal childhood. At the bottom of all true understanding of childhood there must be a recognition of the simple, unpremeditated, spontaneous nature of the child's mental life.

Futility of Threats or Promises of Reward. — Since to the child there is but a rudimentary past and practically no future, the memory of past suffering and the hope of future reward are equally powerless in the presence of a strong present temptation.

The teacher or parent who expatiates in the summer on the coming glory of the Christmas tree wonders why his young hearers are not enthusiastic. To him, Christmas six months hence is as real as the present Fourth of July. Not so to the child. Things six months in the future have to him only a very shadowy existence, if any at all. We have all had the “Be-a-good-boy-and-you-may-one-day-become-president” maxim repeated to us in our juvenile days. Did it, as was intended, inspire us to untiring energy and devotion to work? Scarcely. The next cool swimming-hole had a million times more persuasion in it; and in just about a second and a half it had washed away every vestige of presidential ambition. Early one spring, while frost was still in the ground, I found a number of boys wading in a marsh. I asked the boys if their mothers allowed such trifling with health. One boy told me that he “expected he would get a whipping when he came home.” But coming home was still a long way into the future; and wading was *such* fun. No normal child was very long kept from doing what he really wanted to do by the most dire threats of “licking,” “thrashing,” or “skinning.” Promises of reward are equally futile, if they are not to be fulfilled in the immediate future.

It follows that punishments, too, are less effective with children than with adults as deterrents from

crime. However, the actual infliction of punishment is much more effective than the most vivid description of reward or punishment to come.

It follows that the government of children should consist chiefly in so arranging their environment that they are stimulated and tempted to do right, while they are restrained from doing wrong mainly by having temptations removed and by having their lives filled to the brim with activity in useful or at least harmless directions. As long as teachers and environments are imperfect, however, punishments will probably be more or less necessary. But threats and promises of reward far in the future are nearly always ineffective.

Children not Sentimental. — We older people like to feel miserable at times. We like to moisten the eyes with a pathetic story. Children do not. When moved by pity or compassion, they are pained, and they do not like being pained.

Normal children seldom expatiate on their feelings and emotions, even when these are pleasant. This can easily be deduced from the foregoing, but we reach the same conclusion from direct observation of children. If not taught to do so, they seldom speak of *kind* mamma, *dear* sister, the beauties of sunset, or the pleasures of friendship. Their minds are riveted on the facts, and, though they enjoy the by-play of emotions, they think of them only implicitly.

CHILDREN'S INTERESTS AND HOW TO APPEAL TO THEM

Predominance of the Motor Element. — Nothing is likely to interest children long unless it contains a strong motor element. We are all motor-minded; that

is, motor images are a very important part of the mental images of every one ; but in children the motor element seems to predominate. " Still life " does not interest them. The successful teacher will find something for his pupil to do with hands and feet, and not merely something to listen to, or contemplate. Closely connected with this characteristic is the dramatic instinct.

Strength of the Dramatic Instinct in Children. — The dramatic idea — make-believe — is a very complex idea. Still, even brute creation is in possession of it. Two kittens engage in a mock fight. Oh, how they chew each other up, — apparently, — but they are very careful that teeth and claws do not penetrate the skin. It certainly appears as if they understand and enjoy to make-believe that they are and do what they are not and do not. Children at a very early age show that they have mastered this very complex idea of make-believe. Many of their most beloved games consist in playing that they are " grown ups " ; they play school, and church, and " company." Many a fond parent has elaborately kept up the fiction of a Santa Clàus and innocently thought the child " believed " in " Santy," when as a matter of fact the child was fully aware of the mythical character of the Christmas saint, but was so perfect an actor that he deceived even his parents. It is entirely unnecessary for parents and teachers to tell myths and fairy tales to children *as truth*, for children will enjoy these stories fully as much if they know they are fiction. To the adult, truth is more interesting than fiction, but to the child the zest of make-believe is so rich that it fully counterbalances the lack of reality.

A small boy about four years of age very much enjoyed "surprises" at the table. Some delicacy, supposedly unknown to the rest, was covered with a napkin and when the family was assembled at the table, he removed the napkin. Then all were supposed to clap their hands in joy and surprise. For a long time they had oranges pretty regularly for breakfast, but although he knew all were aware that there were oranges under the napkin, he would cry "surprise" and dramatically snatch the napkin away. "You must clap your hands," he admonished any one who failed to play surprised. At another time he came in with a cane in his hand. His mother said, "Oh, Howard, where did you get that cane?" This struck him as an uncommonly good play, so he said, "Now I'll go out again, and when I come back, you must clap your hands, and say: 'Oh, Howard, where did you get that cane?'"

Children's Fondness for Repetition. — Children like repetition much more than do their elders. In the case just given Howard repeated his appearances and demands for his mother's recognition and repetition of the formula, "Why, Howard, where did you get that cane?" until his mother was thoroughly tired of it. When a story is told to a child, in nine cases out of ten, he will say, "Tell it again"; and he will repeat this request for the same story until his narrator is exhausted. Dramatic plays, like *London Bridge*, will be repeated again and again and again for whole hours, without "change of bill." This is a very convenient characteristic in children for the teachers, for it makes drill work far less tedious to the pupils. It shows also

the wisdom of constant repetition of a few cardinal ideas, expressions, and principles. This is not drudgery to the child. This dynamic interest of the child should be utilized in teaching. Drill on the multiplication table may be made a pastime.

Imitateness. — Imitation is a very prominent impulse in children, even more than with their elders. This is both conscious and unconscious. The child must have a pencil of just the same color as his brother's and must whistle when he whistles, but he will also unconsciously imitate the grimaces and limp of a comrade. From this it is evident how sensitive a child's soul is to its environment. Butter takes a taint from the odors in the refrigerator no quicker than do children's minds from any taint in the spiritual atmosphere. This is closely connected with the mystic power of suggestion.

Suggestion has a terrific force with children. This is why it is usually so futile to forbid a child to do anything without at the same time removing the immediate temptation. "Don't lick the iron fence to-day, Bobby. It is so cold your tongue would freeze fast," said mother, as Bobby stood with his mouth half an inch from the fence. The next minute Bobby was screaming with a half of a square inch of tongue adhering to the iron.

THE ETHICS OF CHILDHOOD AND OF ANTIQUITY

Primitive Morality of Children. — The moral aspect of the child's evolution depends, of course, wholly upon the development of the *ideal*. The moral standards held by children are not unlike those of primitive society. The study of children reveals that few children before ten years of age have admiration, worthy

of the name, for honor, truthfulness, courage, and mercy. Be not misled by the fact that the child will try to make his conscience correspond to Sunday-school models. He may even have quite clear intellectual conceptions of the moral law, and be ready and able to apply it to any given case. This morality is, however, wholly an exotic.

Strength and Cunning. — Boys brag of how many other "fellows" they can "lick" with impunity, not of the odds they dare to take in a fight. They are very indignant at a "cheat," but usually only when their side gets cheated. Boys boast of their muscular strength or mental cunning, not of bravery. "I'm not afraid of going into the river, because I can swim," is an example. The fact that Siegfried was invulnerable reduces the grown man's admiration for the hero, for what valor does the warrior show who knows that he cannot be wounded? But to the child Siegfried with the charmed "coat" was a greater man than Siegfried without it. There is a peculiar tendency to join the stronger side. In schools where no pupils over fourteen years of age are found, and where the teacher makes no conscious effort in that direction, there is seldom a "code of honor"; pupils feel entirely free to "tattle" to the teacher. They do not consider it unmanly to cry at the least provocation. Nor do they recognize mercy as a virtue worth the having. The vikings of the North or Izdubar's heroes in Chaldea were simply overgrown boys, and the boy of to-day exhibits the same cruelty, or rather indifference to the sufferings of others, in his exultant pursuit of some terrified squirrel. *Strength and cunning* were and are — in the case of chil-

dren — almost the only virtues recognized, with one possible exception. Boys do hate a thief.

Honesty. — Historically the law of property was the first moral law evolved, and for good reasons. The institution of property (industrial society) was, together with the family, the first institution evolved. The first truly human relation after those of the family that becomes explicit in man is the relation of owner to property. With the masses "thief" and "convict" are often synonymous terms. Even in the writings of Hume we find that "justice" means right in property relations only. "Honesty" to this day simply means absence of thievish proclivities.

Loyalty. — We find, also, in children and barbarians the rudiments of the virtue of *loyalty*. Children think, at least under favorable circumstances, that it is mean to desert their recognized leader. Instinctively they are loyal to their parents, but even here a gleam of explicit opinion that one ought to stand by one's father and mother at all times may sometimes be discoverable.

Piety is an early virtue. The barbarian and the child find it easy to believe in a supreme Master and Father and to recognize their duty of obedience.

Thus *honesty*, *loyalty*, and *piety* put in their appearance, rising, as it seems, from the realm of instinct. The child recognizes the personalities of master and God much earlier and more clearly than those of himself and his playmates. Thus, paradoxical as it may seem, it is nevertheless true that the child can earlier comprehend by an act of "moral judgment" the duties of worship, of obedience to God, and of submission and

service to a person in authority than the duties of charity of neighbor to neighbor or of the respect that the individual owes to himself. The great fault of nine tenths of our attempted moral instruction is that it ignores this order of evolution of self-consciousness and proceeds on the notion that, of course, the child has the clearest notion of his own personality.

Hence, "virtues" recognized by the child and by primitive man are: physical strength; cunning; and the rudiments of honesty, loyalty, and piety.

Tabu Morality. — On such a system of morality as that described, only savagery can exist. But we do not want our children to be unqualified savages. In spite of the fact that it is natural, we do not desire scalping and cannibalism in the nursery. In its slow upward strivings, the race has also found that this primitive morality does not suffice. Hence an artificial complement has been added to it very early in the evolution of society. This may be conveniently called *tabu morality*.

Thus every tribe that has ever amounted to anything has put certain restrictions on man which are wholly without reason as far as the individual who obeys them is concerned. In general, among primitive peoples to kill a stranger is allowable, even laudable; but if the stranger is under one's roof and has partaken of one's salt, his life is sacred. *Per se*, to lie shows one's acuteness, and even the gods of the mythologies lied; but it must not, in India, be done under a particular species of tree. The malefactor is safe in the temple, however black his crime; to hurt him there would be sacrilege.

Thus antique society imposed many obligations upon

the individual, which, so far as the individual was concerned, were obeyed without the slightest notion why this was right and that was wrong, and in all but an infinitesimal fraction of the whole number of instances, without the least attempt or desire on the part of the individual to know any reason why.

Such *tabu* morality must be established for the child by teacher and parents. It is a great mistake to attempt to make explicit every moral reason *why* to the child. It cannot be done. Instead of wearying him by moral disquisitions on truth, kindness, justice, and mercy, just tell him that he must not do this, that, or the other false, cruel, or unjust deed. The child, if he trusts you, will construe himself the most gruesome notion of the badness of the forbidden thing, and will hate and detest it with all his heart. Thus the average child has no rational basis whatever for holding that a lie is wicked; he cannot have. In fact, many an adult cannot get it by reasoning. But if his trusted grown-up friends tell him that lying is despicable, he will believe them implicitly, and will come to feel in his very bones that lying is contemptible.

The true order in morals as well as in every other art is first *do* and then *know*.

SUMMARY

In early childhood the nervous and muscular systems are too immature to make training in accuracy and complexity of motor and sense operations profitable or even safe. The age of later childhood is the age for drill and memory work.

Children live in the present. Their associations are

narrow and limited, and, normally, they do not formulate any general principles in their thinking. They think rapidly but not scientifically ; and therefore all abstract reasoning more than one step removed from the concrete has no place in elementary schools. Children have only rudimentary notions of a past and a future, but are mainly guided by the present impulse. Hence, threats are wasted on children. Rewards, if in the distant future, are equally powerless. Children are unemotional and unsentimental. They are full of the motor and dramatic instincts, understand and enjoy fiction, like repetition, and are governed by imitation and suggestion much more than are their elders.

The ethics of childhood is very much like that of primitive man, and an adaptation of the ancient *tabu* morality is the most effective method of developing, for the child, a standard of right and wrong.

CHAPTER XXIV

EARLY ADOLESCENCE AND YOUTH

EARLY adolescence is the name given to the period of change from childhood to manhood or womanhood. Its determining physiological event is the development into full functioning of the sexual organs; but this is by no means all. Every nook and corner of the whole being, mental and physical, is affected. It is a veritable rebirth.

From birth to adolescence the rate of growth is constantly decreasing. In fact, often for two or three years just before adolescence, growth almost entirely ceases. Even the most superficial observer must have noticed how of a sudden the child who has almost ceased developing starts growing again, and changes more in a month than before in a year. This is the outward mark of adolescence.

GENERAL CHARACTERISTICS OF EARLY ADOLESCENCE

Before discussing the characteristics of adolescence, let me premise this warning. The adolescent is very variable; no single statement can be made which is true of all adolescents. I have seen many cases in which the adolescent did not manifest a single characteristic mentioned below. In fact every adolescent must be studied individually to get useful results.

What is given below is, however, in the great majority of cases true.

The Adolescent's Lack of Energy. — The adolescent is lazy, or has at least the reputation for being so. No wonder! All his energies go to the building up of "the new, improved, and vastly enlarged plant" which is to take the place of the physical system of childhood. He has very little energy left to put into the running of it. Hence the adolescent scholar should have his program lightened. Treat him as a convalescent.

The Unsettled State of the Nervous System. — The adolescent is *fidgety and unreliable*, likely to go off at any moment in the most inexplicable way. He will cry or get offended for nothing at all. He changes his mind twenty times a day. One moment he plays and romps as a child in perfect abandon; the next moment he is ashamed of himself and tries in his awkward way to act grown up. His habits, even his morals, are unsettled, however steady a child he may have been. The reason for all this is not far to seek. The physical basis of habit and morals we now believe to be the make-up of the nervous system. But in the great change from child to man or woman, the nervous system is redeveloping, so no wonder if many of the old channels and threads get mixed. Deal gently with him, then. He is, in a sense, a baby again, and is not responsible for his actions.

Adolescence an Awkward, Self-conscious Period. — Because the period of early adolescence is the *beginning* of youth, the adolescent finds himself possessed by new emotions and impulses. They are strange and in-

convenient to him. He does not know how to handle them. His new length of limb, his head's elevation above the floor, the new cut of his clothes, the *Mister* and the *Miss* make him feel uncomfortable. He feels as if he had been mislaid with no chance of being found. Then everybody is in the habit of staring at him. The second sentence every one addresses to him is, "You are growing, aren't you? Why, you are quite a little man!"

Let us take pity on the young martyr. Don't compel him to speak "pieces." Keep him out of the public glare as much as possible. Don't show him that you notice his growth any more than you would tell a woman that you notice that her hair is turning gray. Let him get used to his new life as mercifully as possible.

ADOLESCENCE THE TIME FOR CHARACTER FORMATION

"The hand that rocks the cradle rules the world" may be a very fine sentiment, but it is absolutely false. The first twelve years of a child's life count for comparatively little in the formation of character. The period from thirteen to sixteen is immeasurably more important in giving the ethical trend to the mind than all the years of childhood. As we have just seen in the preceding chapter, the child is incapable of more than a very rudimentary moral development. The child's world of thought, emotion, and action is too contracted to form any safe basis for the development of a character that will withstand the temptations of manhood. From many of the strongest temptations, such as the sexual, the child is practically exempt. As to explicit,

intelligent, religious, moral, and social opinions, the child simply hasn't any.

The Fixation of Certain Habits. — It is true that a great deal of character consists in habit, and many habits may be formed for life in childhood. But in the great revolution of mind and body, known as adolescence, the habits of childhood lose some of their compelling force, and in all normal cases it is possible to reshape the whole habit system of the adolescent. The habit that becomes fixed earliest is probably that of pronunciation. The pronunciation of a child of five years is usually as perfect in every shade of dialect and in every linguistic peculiarity as that of a man of fifty. But still, in nine cases out of ten, an adolescent can learn to speak a language without the least foreign accent.

Hence it is safe to say that moral, religious, and social habits can be formed and must be fixed after the beginning of adolescence, and that social, moral, and religious beliefs, codes, ideals, and standard of values must be formed after childhood is at an end.

This truth has been recognized by religious society in all ages. Almost every heathen cult of every age imposed and imposes some solemn ordeal for the adolescent, intended to fit him for the larger duties of adult life. Christian churches have placed confirmation at or near this time. The immersionists do not, as a rule, allow the rite of baptism at any earlier period.

The Right Kind of Teacher for Adolescents. — Adolescence, then, is the age of character formation, and in spite of the high pedagogical authority they quote in their favor, it seems to us evident that those

are wrong who claim that the kindergarten and the primary grades are the most important periods of education.

Character is largely propagated by contagion. The noble heart, the strong will, the refined sensibilities, the pure soul alone can instill nobility, strength, refinement, and purity into other minds.

Persons with ideal characters are not exactly plentiful, even in the teacher's profession; and hence if I were a city superintendent, I should choose among my teachers the most perfect specimens of manhood and womanhood, mental, moral, social, and physical, for the classes made up of early adolescents. This would mean the eighth grade and the first two years of the high school. I should not care half so much in these grades for scholarship as for character. But what is a "good character"? How should it be chosen? First, *don't mistake stupidity and moral cowardice for virtue*. This is a most common mistake. Often your man of limited intelligence is likely to be more correct according to the models of conventionality than your genius. Do not choose for a teacher of adolescents a character which is chiefly remarkable for the evil that is left out of it. Whatever you do, choose a dynamic intelligence, one that *dares* and *does*. Choose a leader among men, a person with initiative, with personal magnetism, one whom the pupils will trust, look up to, and follow. Choose him for the good that is *in* him, not for the bad that is *out* of him. Don't expect to find a faultless person. Choose a person so much bigger than his faults that he can afford to have them.

TEACHING THE ADOLESCENT TO KNOW HIMSELF

To be plain, — and it is silly to be anything else, — teach the pupil the facts about his sexual organs. I know how hard it is to do this, how every person with delicate sensibilities “hates” to obtrude himself upon the sacred personal reserve of another individual. But if for a moment the veil were lifted and we could see the millions of victims of sexual ignorance, the countless young lives blighted, the numberless stars and suns of talent and genius dimmed and darkened just for the lack of a little elementary knowledge of the laws of the springs of life; yea, if we knew but a tithe of this, we should esteem it base cowardice to allow our pupils to grow up without a proper knowledge of themselves.

You cannot overestimate the ignorance on this subject. An excellent teacher, in whose judgment I have absolute confidence, asserts that in a teachers' training school, where she spoke on this subject to some eighty *teachers*, there were several who had not the faintest conception of the most elementary facts about themselves. Thus we leave each generation to solve for itself the most vital and delicate mystery of life.

Dangers against which the Adolescent should be Protected. — Who will teach them if we don't? Very likely the vilest dregs of human society. Have you considered what that means? You cannot protect your son or daughter from such tuition. Many an attractive young person of the same sex as your child, and with whom you never think of forbidding communication, is inwardly filled with “dead men's bones,

and of all uncleanness." He or she will make an intimate of your child and communicate this inward filth.

Modern civilization has added two other ghouls to the list of fiends on the track of the adolescent — the patent medicine vender and the "renowned specialist in private diseases." They want as many patients as possible. So it is in their interest to make as many people as possible think they need treatment. Hence the most innocent and ordinary trifles are minutely described and heralded forth as "certain symptoms" and "awful danger signals" of some loathsome and dangerous disease.

Untold agonies are suffered by timid and modest young people who, though sound as church bells, have fallen victims to these medical sharks. All the victim's little savings, pocket money, and pin money is spent for "free private medical advice" and medicines sent by mail "in plain wrappers." One part of their promise they fulfill. They keep the whole thing secret enough. Trust them for that, the vampires! Add to the unnecessary worry and expense the amount of useless or harmful drugs taken by the victims, and we have an inkling of the magnitude of the evil!

Methods of Instruction. — Against these dangers teachers and parents are in duty bound to protect their charges. The necessary information can be given in three ways: —

- (a) By private interview with each pupil alone.
- (b) By class instruction to a class composed of one sex only.
- (c) By the reading of books written for this purpose.

The last way is the easiest for all concerned. But never put a book of this description into the hands of a pupil until you know it is right in letter and in spirit. Investigate the statements of the book and verify them by good medical authority before you give it to your pupil. If, as is most likely, you find no book perfectly satisfactory, annotate the least objectionable one in such a way that the pupils are thoroughly safeguarded against falling into any dangerous error.

As a rule, the best results are obtained if the book method is supplemented by the class method. For instruction, there is nothing equal to the living voice. Very few people are able to get a "saving knowledge" of any subject from books alone without the living teacher. Hence a few class meetings, with a chance to ask questions by both pupils and teacher, is generally desirable.

Now and then you will find pupils whose peculiar character and environment are such that more is needed. Then the private interview is the duty of the teacher.

SUMMARY OF ADOLESCENCE

The adolescent is a very variable creature, and here it is more necessary than anywhere else in school life to study the individual and treat him according to his idiosyncracies.

Some adolescents retain the care-free, light-hearted child spirit till they are six feet tall; and thus change without any embarrassment from childhood to manhood.

Others fall naturally into the manners of grown people while they are yet children. They, of course, know nothing of the gawky age.

Children are no more attracted to the opposite sex than to their own; but in the nature of things, the adolescent, as a rule, begins to feel drawn to the opposite sex. But instances are not uncommon where adolescents do not care more for the other sex than children do. This liking for the opposite sex is often manifested by the show of unspeakable contempt which boys affect for girls at this age, and the aversion for boys manifested by the girls.

Early adolescence is a veritable second birth, and a birth into a higher life than childhood. It is the introduction to the true golden age — youth.

YOUTH

Youth is the true golden age of life. Childhood is not. Child life is too narrow, too near the animal stage of existence to be worthy of the extravagant praise bestowed upon it by the retrospective poet. Here it is indeed true that "'tis distance lends enchantment to the view." But in youth the spirit sweeps through the whole vast range of human interests; and to the zest that comes from wide interests, strong emotions, and new-found power is added the joy of novelty, and of unknown possibilities, the bliss of the "first time."

CONTRAST BETWEEN CHILDHOOD AND YOUTH

The Child, a Materialist; the Youth, an Idealist. — As we have seen, the child is unsentimental. Youth builds castles in Spain, loves the mystic and supernatural, delights in daydreams and sentiment.

The Child, Self-centered; the Youth, Social. — The child is necessarily narrow in his sympathies. He is

interested in the welfare of but few persons outside of the immediate family circle. "Lord, save me and my wife, my son John and his wife," is a sentiment that children find perfectly natural. As the child's imagination is weak, he cannot "put himself in the other fellow's place," and hence often appears hard-hearted and cruel. Not so youth. This is the age when we overflow with tenderness, pity, and sympathy. The child can scarcely be said to have a social world at all. Youth is the very time of all times for comradeship, fellowship, social pleasures, love, and, above all, friendship. He who had no intimate friend in his youth is not likely to be worth much. How we do trust humankind in those noble days! How we do enjoy the society of our kind! Youth is the age for reformers and martyrs, for heroism and self-sacrifice, for loyalty and discipleship.

The Child, Utilitarian; the Youth, Æsthetic. — The child's first question about an object is, "What is it for?" By this the child means: In what way can we get bread, butter, or amusement out of it? Even when drawing or painting, children do not desire primarily to make pretty things. A child's highest ambition is to make something that is "good for something," *i.e.* useful. But for youth, beauty is one of the great concerns of life. The child-girl cares comparatively little how she "looks." The maiden in her teens finds this a topic of absorbing interest. No normal child cares for classic poetry; no normal youth but tries to write it. The child likes stories of adventure, not because he admires bravery, for he does not to any enthusiastic extent; but because he idolizes success. The youth is enamored of tales of romance and mystery, for they

feed his sentimental nature. He loves courage, chivalry, and magnanimity for their own sake, and not simply for the power to gain the victory.

MEDIEVALISM AND THE ETHICS OF YOUTH

Adolescence and early youth correspond to the Middle Ages in history. There is in both the same religious fervor, the same enthusiasm for the "things beyond." The same tendency to romanticism and mysticism, asceticism and chivalry is noticeable in both. The teacher in treating the adolescent should constantly remember that he is handling a denizen of the medieval world.

Nowhere is this more important than when the ethical concepts of the pupil form a factor in the problem.

The moral code of youth is almost the exact opposite of that of childhood. The emphasis is placed on the social or "altruistic" virtues, and mere brute force and cunning are held in contempt. The moral sense is in this period liable to certain diseases, and against these the parent and teacher should always be on guard.

Mental Diseases of Youth. — *Morbidity.* — There is in all of us a certain appetite for grewsome imaginings. In youth this can easily develop into a disease, luring the unfortunate victim to poison his mind with that literature found in novels and newspapers which deals with the loathsome details of crime.

Asceticism. — Society in its medieval stage, and the individual in early youth, have a tendency to accept the belief that there is moral merit in mere suffering. "Be sure," said a devotee of this doctrine, "that what

is repulsive to you is pleasing to God." This morbid view is responsible for much misery among young people of more contemplative disposition.

Abstract Altruism and Concrete Selfishness. — This is perhaps the most common disease of character among the young. Pious Lulu wants to be a missionary and dreams of sacrificing her lifetime, her energy, and beauty in teaching "black little lambs" in Africa. But she cuffs and scolds her little brother who prefers play to waiting on her. Many young girls aspire to work in the slums or to devote themselves to the emancipation of woman; but it never occurs to them to find out if Sally in the kitchen is overworked or to help Sally's brothers or sisters out of their abject poverty.

The Cure. — The cure is the same as that which the Lord gave the world for medievalism: work. The discovery of a New World, which had to be explored, conquered, settled, and quarreled about; the increased industrial activity of Europe; the invention of printing and the coincident intellectual revival; religious and political quarrels: all these things gave Europe enough to do, so that she found it impossible to go on any longer with morbid mopings.

Let us apply the same cure to the morbid, overwrought, sentimentalizing youth. Keep him occupied. A little drudgery will not hurt him. Mechanical drudgery *only* is, however, far from sufficient. Above all, give him work that calls out his constructive and combative propensities. A small dose of athletic competitive games is not bad. But constructive work, such as gardening, sloyd, actual work on the farm and in the shop, teaching, and the study of subjects that re-

quire a great deal of concentration, form the best antidote. Sunny, simple, and sincere home life gives the atmosphere in which these morbid bacteria do not long thrive.

But let all elder leaders of the young heed this solemn warning: Do not mistake the vital idealism of youth for morbid sentimentality! Very often when we think we discover silly sentimentality in medieval life and in youth, the mistake is not theirs, but ours. The sordid prose of mature life and modern civilization is as frightful a failure in reaching life's ideal as is the overwrought poetry of medievalism and youth.

COMPARISON OF YOUTH AND MATURITY

If men lived ideal lives, maturity would be a larger, stronger, and freer youth. But men do not always live ideal lives. In many of us the divine fire of youth is succeeded by the cold, calculating spirit that we have misnamed practical. I recall a case in point. O, the lavish majesty of his youth! What grace, what poetry was there, what breadth of view, what charity for all mankind, what courage in every just cause! But he grew a year older every year, married, had children, likewise political ambitions; succeeded with both, became a statesman, a pillar of society, a deacon of the church, and a millionaire. Oh, yes — yes — he had marvelous success, had this man — but at what cost? At fifty, he was a man without ideals — illusions of youth, he called them. His life was sordid prose, mere ledger accounts. In politics he had compromised with his conscience and the devil Expediency until, to save his soul, he could not tell his conscience

from expediency. Still he was what the world calls a man of "sterling character," and was held up as a model to the young men of the state. All that was really human in him in his mature life were the fundamental impulses connected with family life — his love and devotion to his wife and children. All else had dried up in the fervent heat of a "practical" life.

It need not be so. All the enthusiasm of youth can be kept, even under the snow of old age. All that we must of necessity lose with age is the youthful physical frame and that delicious shuddering expectancy with which inexperience greets the first experiences of adult life; and these are more than counterbalanced by the widening of the intellectual horizon and the deepening of our whole nature which ought to be the result of an enlarged experience.

But, alas! it is yet true in many cases, that the individual, as he advances in years, becomes more sordid, hard-hearted, and narrow-minded.

Psychologically, the process of growing old consists in getting confirmed in a set of habits. This is at once the strength and weakness of maturity. Our habits are the grooves in which our minds run, the rails along which a much greater speed can be maintained than on a road without rails. The mind works faster, better, more easily, and more efficiently in these ruts than out of them. Thus maturity, with its established system of habits, can do more work, and can do it more easily and more gracefully, than youth which is without these habits.

But the locomotive which runs so well on its rails is perfectly helpless when off them. The whole wide

world that is unrailed is not for the locomotive. Likewise, as the ruts of habit deepen in our minds, we, as a rule, find it harder and harder to get out of these ruts. This refers not to ethical and technical habits alone, but to intellectual as well. Youth is open to conviction; the person of middle age has his beliefs fixed. Harvey, the discoverer of the circulation of the blood, said that he could make no man over forty believe in his discovery. Almost all converts and proselytes are young.

THE SPHERE OF INSTRUCTION FOR YOUTH

Instruction in Science. — Youth is the time to learn to think scientifically. Not that it is natural for youth to be scientific. Far from it! Most young people are perfectly content to go on in the same slipshod rule-of-thumb manner of thought that served them so well in childhood. But youth *can* be scientific if it tries. It is no longer antinatural to think principles, laws, and relations explicitly. Hence youth should begin the study of science — not only natural science, but social and linguistic science as well. By science we mean here the systematized laws (concepts) that constitute the essence of the facts of the universe. Just as truly as it is false pedagogy to require definitions of children, just as certainly is it bad teaching to neglect to demand definitions and the exact statement of principles of youth. The logical *why*, the scientific *how*, should be the main theme in the education of youth.

Æsthetic and Ethical Instruction. — Youth is also the time for æsthetic education, and for the crowning of the work of ethical education.

PART II
PEDAGOGICAL APPLICATION
OF PSYCHOLOGY ———

CHAPTER XXV

THE ART OF STUDYING

EYE, EAR, AND HAND

PUT down in black and white, it is a truism, but nevertheless it needs constant repetition, that the eye, ear, and hand of the student should be in condition to do the work required of them.

The Eye. — Every teacher should know that his pupils can see their work. Nearsightedness and astigmatism are the two most frequent imperfections that escape the teacher's observation. Every teacher should learn the simple tests by which the presence of these imperfections can be discovered.

The Ear. — Deafness is so easily discovered by tests that any person with common sense can invent, that there is no excuse for the fact that in a large per cent of our schools there are pupils who are thought and even called dull by the teacher, when the real truth is that they do not hear sufficiently well to understand all that is said.

The Hand. — The hand of the young child is seldom ready for the work imposed upon it by our present system of education. The child is not ready to write and draw except with arm movements until his eighth or tenth year. To determine when the child is fit to begin to use pen and pencil does not require technical

skill; only observation and moral courage to obey common sense when convinced that our time-honored practice is wrong.

Visualizers, Audiles, and Motiles. — The mind deals in symbols. There is no such thing as “pure” thought; every idea is shadowed forth to the mind itself by the image of something visible, audible, or tangible. Only through these images is thought communicated from one person to another. The same thought has several sets of images as its representatives. Thus *piano* may be represented in the mind by the visual image of a piano, by its sound, or even by the image of the motion in playing it. So, in reading a description of an historical scene, we *see*, *hear*, and *do* it in imagination. Some chiefly *see* the scene in imagination; these are the *visualizers*. Others find their auditory images strongest and most reliable for memorizing. These are called *audiles*. Finally, many find that their appreciation and grasp of the situation depend almost exclusively on a mental imitation of the motor element of the scene. These are of the *motor* type, or *motiles*.

Eye Training at the Expense of Ear Training. — Some minds learn best through the eye, others through the ear. The eye-minded pupil should spend some time daily in training his neglected sense of hearing, but at the same time it is wise for him, when he is after results, to use his eyes chiefly. Likewise, *mutatis mutandis*, should be the course of the ear-minded.

Our present system of education trains the eye at the expense of the ear. We gain almost all our knowledge through silent reading or through visual observation or experiments. The result is that our ears are

left in pristine ignorance. Few people, nowadays, gain any knowledge worth having from speeches, lectures, and sermons. When we have heard a speaker on some subject, and are interested, we hie ourselves home to "read up on it"; for we don't know "the first thing about it" yet. An ancient scholastic superstition makes professors still lecture, but their students do not listen to learn, but to scribble off the words as completely as possible. To get at the thought of the lecture, they afterwards burn the midnight oil and "bone" over the crabbed notes so as to get the knowledge through the eyes.

That the neglect of hearing as a knowledge-gathering sense is an evil needs no proof. To make its full impression upon us, truth should come to the soul through every avenue. The full grasp of a truth is not obtained until hearing furnishes its part in the circuit of comprehension.

As remedies, the following are suggested. Students should be encouraged to read aloud whenever and wherever possible. When two students occupy the same room and have the same lessons, it is a good plan for one student to read, and the other to listen to the lesson. The listening student should not have his book open; thus he gains doubly in discipline; his ears are trained, and he acquires the valuable habit of holding his mind responsible for the retention of that which has been presented to it only once. When reading from a book, one often lets his attention wander because he knows that if he should miss anything, he can easily glance back and pick it up. As a result his attention is slovenly, and he has no definite grasp

of anything; but in listening to something, he knows that it is now or never, and his attention will act accordingly. This habit of close attention is really in the end the cheapest for the amount of work it will accomplish.

Importance of the Motor Element.— Until he has observed himself scientifically, almost every one is ignorant of the great importance of the motor element in his imagination. The motor element is strengthened by actual imitation. Hence the device employed in the Gouin method of learning languages: When possible, act out the expression while saying it. Thus, when saying in the new language, "I open the door," open a door. Then, as you close the door, say, "I close the door." You will find that this makes your practice more than doubly effective. Dramatic representations by the pupils, however slight, aid greatly in the study of history. After a pupil has once acted out an historical character, that character *lives* for him. This is one of the reasons why experimenting in natural science produces so much more vital knowledge than that derived from books. This is also one of the reasons for putting sloyd in the front rank as a means of education.

THE PROPER ATTITUDE FOR STUDY

The Right Mood.— Teach your pupils to make work, not play, of their study. They should train themselves to have definite times for study and to buckle down on the minute, and keep buckled down to business as long as the study period lasts. Teach them to disregard their "moods" altogether in this matter, and to mind their "tenses" (times); and they will soon find that

the proper attitude will come of its own accord; for it is true that the emotional state does make a great difference in the fruitfulness of our efforts. The pupil should be in physical and mental comfort and in sympathy with his study. Any excess of feeling is likely to decrease his logical acuteness; but this should not be interpreted to mean that he must not feel strongly when the subject so requires.

The Critical Attitude. — The attitude of the student is all-important. In receiving information he should be critical and independent and take nothing for granted until it has justified itself to his sense of rationality. That is, he should never for any chain of reasoning take the author's say-so. He should always run through the logical process from premises to conclusion and satisfy himself that it is correct. At the same time he should learn to have the receptive attitude. After having studied a piece of literature critically, he should not stop, but read it again, surrendering himself to its charms, and attending to its emotional interests.

Sympathy. — Wherever the human element enters, his attitude should be sympathetic. No person, age, or race can be understood by us until we have sympathized with them in weal and woe.

In studying the French Revolution, the pupil should sympathize in turn with the miserable peasants, the brilliant political philosophers, the brave reformers, the refined emigrés, the splendid nobility, the unfortunate king and queen, and all the unhappy victims of that awful political hurricane. Sympathy with all that is truly human in every partaker in the great drama im-

plies necessarily righteous indignation and passionate condemnation of all that is vicious, low, and brutal. Thus, in the above example, the students should fully realize the selfishness of the nobility, the weakness of the king, and the brutality of the reformers. Our boys do not understand the War of the Revolution until they see the English side of it as well as the American, until they realize that it was inevitable for most good and wise men on the British side, like Samuel Johnson, to regard the American patriots as rebels. The broad, warm, intensely human spirit who rejoices, suffers, lives with the characters he describes, is the ideal historian and the ideal student.

Intellectual Courage. — The grit to launch out, to take the initiative, to venture a decided *posito*, lies at the very heart of successful thinking. Suppose it is a problem in algebra. The mental coward is not daring and reckless enough in his invention of hypotheses for a solution. He dares not take for granted that his mind will and must keep a great number of conditions clear and distinct and in the very center of its attention. When black mystery surrounds him, he gives it up secretly to himself from the beginning, and feels sure he is to be defeated. And so he is, of course.

The grim determination that the edge of one's mind shall not turn, that whatever betides and whatever the cost, one will solve the mystery, this is an essential of successful thinking. Self-reliance, courage, integrity of purpose mark the clear thinker.

Fixing Facts. — Though we cannot diminish the amount of repetition necessary to fasten irrationalized facts in the mechanical memory, we can make the

process more or less pleasant. Thus, the best way of getting the facts of history does not consist in reading over and over again a small manual. The better way is to read several extensive accounts of the events in question. The constant recurrence of the same facts in different connections will fix them in memory quite as quickly as mechanical drill on the contents of a small book.

In learning a science the student should strive to reach as high a degree of the following attributes as possible in his thought: vividness, clearness, distinctness, comprehensiveness. Imitate Abraham Lincoln, who said that when he studied he was never satisfied until he had bounded the new truth north, south, east, and west. As a rule, we are too easy on our imaginations. Put color, detail, and life into your everyday thinking.

SUGGESTIONS IN REGARD TO THE NOTEBOOK

The Abuse of the Notebook. — Nine tenths of the notebooks of students are a decided detriment to their owners. They have spoiled the memories of this generation. The notebook works its saddest havoc in the higher institutions of learning where it is a part of a greater evil — the traditional university lecture. It is fairly safe to assert that as a rule what a student puts down in his notebook during a lecture he does not put down in his memory. Professor J. E. Erdmann in his "History of Philosophy" sums up the whole situation in a sentence when he says, quoting Schleiermacher, "A professor who dictates sentences for his students to take down in reality claims for himself

the privilege of ignoring the discovery of printing." The lecture which the students are expected to write down word for word has to-day no excuse for being.

The lecture has its place, however, but only the lecture that the pupils are expected to *hear* when it is delivered. When the pupil listens, he should have his whole soul in his ears; if he is scribbling for dear life to get down the lecturer's words on paper, a part of his mind is running down and out at his pencil point, and we have the undesirable condition known as divided attention. The result is that at the end of the lecture the pupil has no clear and connected conception of what the lecturer said, but rushes home to guess what his scrawls in the notebook mean. That this is a decided waste of mental energy ought to be plain.

How to use the Notebook. — At the lecture or recitation the pupil should attend to what is said with his undivided powers. He should take no notes. The only permissible exception is the jotting down of names and dates that cannot be remembered. When the recitation is over, and the pupil is back at his desk, he should proceed to make an entry in his notebook of the lesson or lecture, as follows:—

First, he should make a very brief systematic outline of the subject, to occupy a separate place in the book, or, better still, be put in a book of its own. This outline should be the *pupil's* outline. The teacher or the text may give an outline, and this may be used as a basis for the pupil's outline, but the pupil should not be satisfied until he has introduced some "improvements" in the outline. He has not perfectly assimilated the thought of teacher and text, or he has not

maintained the critical attitude as he should have done, if he cannot suggest what to him seem improvements. The pupil should also put in his notebook any information gained in class or from lectures that cannot readily be found in texts and that is of sufficient value to be remembered; also any valuable new point of view, or new insight, he has gained; and finally his own views, especially when they differ from those generally accepted.

A Few Rules. — Make your notes as brief and pithy as possible. Half a dozen lines on each subject a day is usually enough. Write nothing in your notebook that you do not expect to read over and over again in the future. Leave every other page blank for future notes. Date every entry. Thus your notebook will become a record of the evolution of your mind.

Exercise

1. Are you predominantly a visualizer or an audile?
2. Listen to a paragraph read by some one else, and then summarize its contents; then read another paragraph of about the same length and difficulty, and summarize its contents. Which sense, sight or hearing, gave you the best results?
3. Have you ever heard of notebooks being bequeathed for years from class to class in a school? How much benefit does a pupil get from copying another's notes?
4. Did you ever hear of any one who was converted in religion, politics, or anything else by means of a debate? In what attitude is the mind of the debater towards the propositions of the other side?

CHAPTER XXVI

THE RECITATION

THE PURPOSES OF THE RECITATION

THE purposes of a recitation are: —

(a) To test the pupil's faithfulness and success in acquiring and assimilating the lesson.

(b) To drill on the memory and art element of the lesson.

(c) To teach the pupil to think rationally.

(d) To help him gain culture.

(e) To prepare for the study of the next lesson.

In and through and above it all, the true teacher seeks to create the right ideals in his pupils, but as this is a constant element in all true teaching, and the all-important element, it is not coördinate with the specific purposes of the recitation and is not mentioned as such.

THE TEST

As a rule, the test should be incidental. While the teacher directs the energies of the class toward the realization of the other purposes, it will generally become manifest whether the pupils have been faithful in their efforts to study the lesson.

At times, however, it becomes necessary to reveal the poor student definitely and swiftly both to the teacher

and to himself. Then it is best to ask a question which is capable of a brief, definite answer easily derived from the lesson. If the pupil suffers from laziness or confusion of ideas, make this very plain to him. Show him the imperfections of his answer, generally by pointed questions. Here "leading questions" are not out of order. If lack of application is the cause of the failure, let it be apparent. At times it may be best to inform the pupil briefly and brutally, "You have not studied this lesson," and ignore him for the rest of the recitation. But some pupils develop a beautiful resignation under this treatment, and will bob up cheerfully, recitation after recitation, with an "I don't know," and sit down with a complacent sigh as if now *that* worry were over. Some teachers inform such a pupil regularly that he ought to study his lesson, that he cannot expect to pass, and that it is a "shame." To all of which the pupil agrees by a deprecatory stoop in his shoulders and a downcast glance; but a second afterward he is as happy as the best of them. Scoldings run off his soul like water off the back of a goose.

The proper treatment in this case is a little judicious "grilling." Don't let the habitually ill-prepared pupil get off with an "I don't know." Ply him with other questions, and let him repeat his formula till he gets tired of it. Give him the book, point out the passage, and let him read the paragraph referred to. Then when he closes the book, open the battery of questions on him again. If one or two doses of this treatment do not cure him, harsher methods may be necessary. Too much time may easily be spent in mere testing.

DRILL

Necessity for Drill. — Every subject contains a certain element that must simply be memorized. In some subjects, like arithmetic, there are certain processes, a certain mental technique, to be acquired. Others, again, like manual training and the experimental sciences, require certain manual skill. This is the art element in education. (*Art* here has no æsthetic connotation.) These are the *habit* studies. These can be acquired only by that repetition which is generally known as drill.

Much of this drill should be gained by the pupil when preparing the lesson; but in all work below the high school, drill of the technical element should consume a generous share of the recitation time. Let us adopt in a measure the practical methods of the fathers! There is but one way of acquiring the technique of civilization, and that is the method of the old school, — drill, and drill in the class under the eye of the teacher.

Methods of Drill at the Recitation. — The *whole class* should be kept busy throughout the recitation period of drill, and the teacher should be able to discover an error in the pupil's work the instant it is made.

In *mathematics* the whole class may be put to black-board work. Rapid and accurate computation and correct and neat statements should be required. After the pupil has thus told what he has done in written mathematical language, he may be required to spend some little time in telling the same tale in oral mathematical language. The rest of the class should act as

critics. In this explaining of problems, the tendency is always to require too much of the pupil. Too often the teacher will require the ten-year-old child to reason as explicitly as he himself reasons.

If *spelling* is taught as a separate subject, the written recitation on tablet or blackboard is the best form. As a change and recreation, the oral recitation may be introduced.

History and *geography* require less drill work than most subjects. Frequent brief chronological summaries, written by the pupils on the blackboard, are a useful drill in history. If mistakes are made, the pupils should correct them, not simply be made cognizant of them. Gazetteer work and map drawing are useful for the same purpose in the geography class. Free-hand drawing of maps, first from copy and then from memory, is the only kind of map drawing that is not a waste of time and energy in the grades. For seat work the tablet is excellent, but the recitation drill should be conducted at the blackboard.

Every word the pupil speaks is a *drill in oral language*. The general rule is: Correct every mistake in language as soon as made, and see that the pupil repeats the correct form. There are exceptions to this rule, the occasions for which the tactful teacher will easily discover.

The *written language* work of the recitation should generally be blackboard work. It should be criticised either by another pupil or by the teacher, and should invariably be corrected by the pupil himself. Misspelled words should be rewritten correctly several times.

TRAINING IN THOUGHT

Though drill is important, it is by no means all-sufficient. The pupils should also learn to think. This mere drill cannot teach. The characteristics of successful thought may be catalogued as follows: interest, vividness, clearness, distinction, and organization.

Interest. — Keep on the pupil's plane. Let the pupil do the thinking and talking; don't talk to him and at him all the time. Connect his lessons with his daily life. Be a comrade to your pupils. Shed the solemn Prince-Albert-coat air. Cultivate a sunny disposition and invite smiles and even laughter to sojourn with you in the scholastic shades.

Vividness. — Demand and give details. This gives life and color to history and geography. If practicable, bring the thing itself; but if the thing itself should happen to be a volcano, bring a model or, if this is impracticable, a picture. A colored picture is better than one in black and white.

Clearness and Definiteness. — Almost invariably the thought of the pupil is dim and indefinite. The greatest service the teacher can do for the improvement of the thinking of his pupils is in clarification. This should be done at the recitation by judicious questioning. When a pupil has caught a truth by the hind legs, don't become cheaply sarcastic over the undignified appearance he and his truth make. Show your gratitude for what he has done, but make it plain that improvements are desirable, and indicate by question or remark the direction in which improvement is needed.

Keep this thought clearly before your mind: It is not sufficient that the *teacher* think clearly. This is often forgotten. Some teachers get into the habit of furbishing up the vague answers of their pupils into logical exactness, and then passing on to another question. The class easily falls into the habit of letting the teacher do the thinking. This practice has given rise to the rule: Never repeat and improve the answer of a pupil. Let the pupils themselves do the improving.

This rule may, however, become a pedagogical heresy, based on the false notion that there is something dishonorable in all thinking that is not wholly original. By all means furnish the clear and exact thought and expression yourself if you cannot readily get it from the class; but be sure that the class *thinks the thought* after you. Don't ask them to repeat your statement. A mere repetition signifies nothing, for it may be done without understanding the thought in the least; but ask the next question so that an answer to it will involve a clear conception of the thought that went before.

For example, the teacher has just made plain to the pupil that Simon de Montfort's parliament of 1265, though the first parliament in which the Commons were represented, was not a legal parliament, because summoned by a revolutionary leader; and that the complete parliament consists of King, Lords, and Commons. His next question may be, "Why was the parliament of 1295 a legal parliament?" If the pupil answers, "Because the King summoned it in the customary fashion," he is right; but if he answers, as a loose thinker is likely to do, "Because it consisted of King, Lords, and Commons," he shows that he did

not follow the thought of the previous discussion. Equally wrong would it be for him to answer the question, "What made this parliament complete?" by "Because it was legally summoned."

The formal lecture has no place in the grades or the high school. The teacher, in giving information and leading the thinking of his class, will find the conversational method best.

Devices for securing Clearness of Thought. — Here are a few devices that have proved useful in securing clearness and exactness of thought. Ask the pupils to describe a character or an event by *one word*. Let all that wish present candidate words, and then let the class and the teacher decide. A recitation on some topic expressed in one simple sentence is a useful variation of the above. When, as often happens, the beginning and end of a pupil's answer do not fit together, and the pupil does not readily note the error, send him to the blackboard to write it out. A written imperfection is more easily discovered than an oral.

Organization. — The organic connection of every idea with other ideas should always be emphasized. This is the truth of correlation. Oral and blackboard summaries and outlines should often be called for. A useful exercise is the Logical Chain. This consists in giving the chain of effect and cause for as long a distance as possible. For example: *malaria* — *parasite in the blood corpuscle* — *mosquitoes* — *stagnant water*.

TRAINING IN CULTURE

The teacher and the class should not spend all their time in the critical, analytical frame of mind that comes

naturally with intense intellectual work; the sympathetic, synthetic mood should be invited when literary beauty is at hand. Let the class read at times for pure enjoyment, and don't worry about the "purpose of the author" or the logic of the argument.

THE ART OF QUESTIONING

The teacher's questions should be definite. One answer and only one should fit each question.

Leading questions are bad under all ordinary conditions of the recitation. Rarely, however, occasions may arise when a leading question will straighten out a bewildered pupil better than direct information.

Questions that may be answered by *yes* or *no* are generally inadvisable because they narrow down the pupil's necessity for thinking to its smallest extent. They also encourage guessing. The pupil is right one chance out of two,—a luring gambling proposition.

The question that offers alternatives is objectionable on the same grounds. Often, however, an alternative question is the only natural one to ask. Then ask it, but tack on a *why* or a *how* to compel the pupil to give the reasons for his choice.

The topical recitation is to be preferred to the question method, as soon as the pupils are ready for it. It gives training in consecutive thinking.

The "Answer in Complete Sentences" Fallacy.—To require the pupil to answer in a complete sentence is often an absurdity. Pupils and teachers are human beings, and schools are on the surface of this planet. The same laws of grammar, logic, rhetoric, and good sense hold inside of the walls of the schoolroom as

outside. Good taste and the laws of language require that no effort should be wasted. The complete-sentence answer is generally a clumsy and unwarranted waste of words. Let your pupil answer you just as you would expect a cultured person outside of school to answer the same question. When you suspect that the brevity of the answer hides imperfection of comprehension, it may sometimes be well to ask a pupil to fill out the ellipsis; but such occasions are exceptions, even if frequent.

The following anecdote is better than an argument. Institute conductor *A* believed that every answer in the schoolroom should be made in a complete sentence. *B* dared to question the absoluteness of this rule. *A* declared dogmatically that there are no exceptions. A little while later, when it was *B*'s turn to speak, he asked *A* what time it was. *A*, off his guard, answered, "Ten o'clock." Back came the crushing query, "Why didn't you answer in a complete sentence?" This would have finished any ordinary mortal, but *A* was not an ordinary mortal. He did not know when he was beaten, so he began a long argument in favor of the complete answer. *B* listened patiently until *A* had exhausted his eloquence. Then, as if to sum it up, *B* said, "So then, if I understand you, you hold that the answer should always be a complete sentence?" "Always," shouted *A* with emphasis.

THE PUPILS AS CRITICS

Some teachers fear their dignity would be impaired if they allowed the pupils to criticise the teacher's opinions. This is false pride, and such dignity never

did either them or their pupils any good. By its very nature, truth is no respecter of persons, and as truth-seekers we are not in the right attitude until all superstitious regard for person and position is obliterated. The teacher should recognize his own fallibility and always welcome any respectful objection from the pupils.

Many teachers object to allowing the pupils to criticise one another. It is feared that this may breed faultfinding and bitterness between pupils. This objection is based on a misconception. Truth and falsehood are universal, and not our individual property. Every pupil should recognize that it is not John and Mary that are up for discussion, but the truth or falsehood of John's or Mary's opinion. Children will easily learn to conduct such a discussion in a perfectly impersonal manner.

This is the only method of keeping all the pupils busy in every recitation. Make each pupil responsible for the correctness of every other pupil's recitation. As a rule as soon as a pupil's recitation on any topic is finished, every pupil who does not agree should raise his hand immediately, and should be given a chance to state his criticisms.

Exercises

1. Criticise this class recitation question: George, who was the second president of the United States?
2. In almost every class there are some pupils who are much slower and others who are much quicker than the average in their thinking. Give some devices by which the slow ones may share in the recitation and the rapid ones may still be kept busy.

CHAPTER XXVII

HOW TO TEACH SCIENCE AND WHAT SCIENCE TO TEACH*

THE DOUBLE OBJECT OF SCIENTIFIC STUDY

THE double object of all scientific study is to put the pupil into possession of (a) a trained *attention*, that is, skill in thinking, and (b) a well-chosen and well-organized store of knowledge.

Training in Attention, or the Skill of Thinking. — More or less exact and happy synonyms for the power of attention are *concentration of mind*, *logical faculty*, *ability to reason*. Like all other skill, it can be acquired only by practice. The constant aim of the pupil should be to attain to a higher and higher degree of concentrated attention. As he grows in ability to concentrate he will find that his powers of analysis and synthesis increase and that his ideas become clearer, more definite, and more vivid.

Educated attention has the following characteristics :

It produces *clear* ideas. The subdivisions and organization of the idea are plainly marked out for the mind.

It produces *distinct* ideas. Each idea is definitely

*The word *science* is here used in its broad meaning, as denoting all classified knowledge.

marked off from all other ideas, and its connections with other ideas are defined.

It produces *vivid* ideas. There is no mist, incompleteness, or elusiveness about the conceptions of the educated mind, except when it attempts problems which lie on the border of the unknowable.

We may, perhaps, here distinguish two kinds of thought: *critical* and *constructive*. Our schools drill almost exclusively on critical thought. The object of the thinker in school exercises is nearly always to discover the thought that some one else has had before him. Thus, the object of the scientist is to discover the thought in nature, "to think God's thoughts after him." In history the object of the student is to discover the thoughts of "the men of old." The student of literature seeks to discover the thoughts of the author. The student of mathematics seeks for the thought-relations already in the problems. This we may call critical thought, and of it there is an abundance in our schools.

Constructive thought is, however, rarely met with in the school, but is in great demand in real life. The farmer in planning his work, the engineer in building a bridge, the politician in laying his wires, do not simply *discover* "the thought in the thing," but they must build thought-complexes to meet special demands.

The following school exercises give training in constructive thought: composition, the invention of problems in mathematics, discussions of what "might have been" in history, and all sloyd work, but especially where the pupil is allowed to invent his model.

All exercises to strengthen attention should follow

the laws of attention. The work must accommodate itself to the pulses of attention, and should make such a demand on the pupil's energy that the maximum amount of work can be secured before fatigue sets in. The work should as far as possible be directly and pleasantly interesting to the pupil.

The Acquirement of a Store of Knowledge. — The mechanic does not bore with a saw nor file with a hammer. Our store of knowledge furnishes our tools for thought. We cannot judge horses by our knowledge of Latin grammar; nor will our familiarity with French help us very much in understanding a German address. Hence, whenever we offer a pupil a particle of knowledge, we should first make sure that this bit of knowledge will be of use to him in acquiring other knowledge of which he stands in need. While gaining an education it is the pupil's business to prepare for complete living by acquiring tools for every great department of knowledge. He should waste no time on worthless knowledge, that is, knowledge that is neither useful in itself, nor introductory in the most practical way to useful knowledge. This condemns at once the one-sided grammatical training of the old classical course. Nor does the old-fashioned teaching of history fare any better. In the life of the ordinary or even extraordinary American, of what use is the knowledge of the details and dates of the Peloponnesian war or the intrigues of the court of Louis XIV?

THE PLACE OF SCIENCE IN THE SCHOOL CURRICULUM

Age and Stage. — It is a truism that the work of the pupil should be suited to his mental development, yet

no law of teaching needs more repetition, for in our anxiety to do much, we almost universally give the pupil work that is from one to ten years in advance of his ability.

The following seems to us a fair division of the field for education in the sciences. (Note that the art, the technique of civilization, is not in question at all at this point.) The emphasis should fall on the substantive side of the universe. The knowledge of man and nature should get the lion's share of the time. This means *social science* and *natural science*. Some attention should, however, be paid to the formal side of the world of knowledge. *Mathematics* and *language* should receive a share, but a smaller share than the substantive sciences.

Classification of the Sciences. — We may group the sciences as follows: —

(a) *The natural sciences*, which treat of the *real*, or *substantial*, side of nature, or the external universe.

(b) *Mathematics*, which treats of the *formal* side of nature, or the external universe, and includes the sciences of time and space.

(c) *The social sciences* (including history) and *psychology*, which treat of man as an individual and as a member of society, that is, of spirit (or of consciousness, or of the inner universe) on the real or substantial side.

(d) *Logic* and the *sciences of language* (philology, grammar, etc.), which treat of the formal aspect of the same subject.

(e) *Philosophy*, the science of sciences, which deals with the postulates of the other sciences.

THE NATURAL SCIENCES

The purpose of instruction for children and youth in the natural sciences is to give the pupil (a) some

“practically” useful knowledge, as, for example, of hygiene; but mainly (b) a broadened intellectual horizon, the true scientific viewpoint, and the modern attitude toward natural phenomena. He will not fancy that a comet predicts war, that grain must be sown during a certain phase of the moon, or that the “humors” (liquids) of the body determine character.

Outline of a Course in the Natural Sciences

For Children:—

Nature Study

(The elements of all the natural sciences taught concretely in connection with *Geography* and *Hygiene*, many experiments, mainly performed by the teacher)

For the High School:—

At least one *Biological Science* in addition to *Physiology*

Physics

(Mainly descriptive, only slightly mathematical)

Chemistry

Physiography

Value of School Laboratory Work.—It is scarcely necessary to insist on the laboratory, as its importance is conceded on every hand. But the *reason* for the laboratory in the high school may need statement.

Why do we perform experiments at all? Because a vivid, clear, and complete conception of any scientific truth is the great desideratum in all teaching of science, since no repetition of dim and confused conceptions will ever result in a clear mental grasp; and because a vivid and complete conception is never reached so expeditiously and certainly as by handling the thing itself. He who has burned a watch spring

in oxygen has a living knowledge of oxygen that no textbook statement can give. A whiff of hydrogen sulphide will identify that gas for you to all eternity. Rigging up and running an amateur telegraph line is an easier and surer way of understanding the telegraph than listening to learned lectures.

Just as in the pedagogy of art the great word is *repetition*, so in the teaching of science the important principle is a *clear and distinct conception*; and our chief means for acquiring a clear and distinct conception is experimenting, handling the thing itself.

MATHEMATICS

Purpose.—The practical use of arithmetic is very great, although it has been exaggerated and over-emphasized in our schools. But as a discipline in habits of exact, clear, and definite thought and expression, the study of mathematics is unexcelled. Every class in mathematics is hence also a class in language and logic.

Outline of a Course in Mathematics

For Children:—

Number Study and Inventional Geometry

(Much drill in the art of arithmetic (see Ch. XXVIII),
and a very little of the science of arithmetic)

For the High School:—

Elementary Algebra as the simpler science, first, then:

Scientific Arithmetic

Geometry

Higher Algebra

Trigonometry

THE SOCIAL SCIENCES

Purpose. — To know men and society, this expresses the purpose the pupil should have in studying history and the other social sciences. Herbert Spencer observes that history as philosophy-teaching by example is a failure. Every sect and creed in religion, every form of government, every social vagary, has appealed to history for its justification. Able and brilliant men defend protection by the "teachings of history," but equally able and brilliant men use the same history to prove that free trade alone is rational.

It is true. We should not look to history for a dogmatic statement of any social theory. But he who has studied history aright has become better acquainted with *men*. He knows their foibles and weaknesses, their ideals and aspirations. Given the circumstances, he knows what they are likely to do. Tell him their deeds, and the conditions under which they were committed, and he will tell you their motives. Because he knows Cæsar and Socrates, Shakespeare and Gladstone, the Athenian citizens, the Roman gladiators, the American pioneers, the German scholars, and the medieval monks, he knows his next-door neighbor better, and makes a better neighbor. Then, how it widens his intellectual horizon! How much richer, nobler, and more worth while is the world possessed by him who is acquainted with the great drama of man, than the petty and narrow circle of thought that imprisons him who is ignorant of history!

Nor is this all. Man as a man, as an individual, does not exhaust history. It also — and indeed that

is its greatest work — acquaints us with society, the institutions of civilization. Organized society, what a mighty thought! All that makes us better than the beasts of the field is included in this word. All the divinity of man is there. It is indeed no small thing to get acquainted with the social, the institutional life of man. The true study of history is the only source of inspiration for intelligent philanthropy and rational patriotism. Only this makes us truly human, or humane. And in spite of the strictures of Herbert Spencer, the true study of history does save us from many a social heresy. It is safe to say that three fourths of the social nostrums proclaimed by cranks, charlatans, and pot-hunting politicians never gain any adherents from those who have studied history to some purpose.

Outline of a Course in the Social Sciences

For Children:—

History

(This should be taught incidentally by stories told to the pupils by the teacher, by supplementary reading, and literature. The material should be mainly biographical, and should not be confined to American history. In the seventh and eighth grades, the use of textbooks may profitably be begun. Civics may be taught incidentally. Let it connect with the daily life and surroundings of the pupil.)

Ethics

(Every lesson in school, the personality of the teacher, and the whole institution of the school should be and can be an efficient course in this subject.)

Good Manners

(These are also best taught indirectly. But in this subject, individual instruction as occasion offers is also needed.)

For the High School:—

Ancient and Medieval History

(A short course)

History of Modern Europe

(This course should be twice as long as the preceding, and emphasis should be placed on the history since the French Revolution.)

American History

(This should come last of the historical studies, to insure ripeness of mind in the pupil.)

Civics, or Politics

Psychology

Economics

Ethics and Law

(It is questionable whether it is wise to have separate classes in ethics, law, and psychology. Sometimes it may be possible to find a place in the high school curriculum for one or two of them; but usually we must be satisfied with teaching them incidentally.)

THE SCIENCES OF LANGUAGE

Again we must repeat the warning: scientific thought is not for children. And of all science, none is less suited for children than linguistic science. The subject matter is so abstract, so formal, so elusive, and so far removed from the regions of the child's natural habits of thought that he has normally no interest in it.

However, if care is taken to make the work concrete, if all abstract reasoning and definitions are shunned, a very little of the elements of linguistic science may be profitably taught to children. The interest, to be sure, must be artificial and not natural, but there is no reason to believe that all artificial interest is harmful. The great danger is, however, that time may be taken away from more suitable subjects. Hence, just as we have

nature study and number study and historical study (social study), we may also have *language study* for children.

Here are some suggested topics, with the warning that any great extension of the field is dangerous:— Sentence, subject, predicate, direct object, parts of speech, the paragraph, some figures of speech, different classes of style, rhyme and rhythm, vowel and consonant.

The *art* of language is quite another matter, and will be discussed in the next chapter. Every class should be a class in language. Childhood is the time for acquiring the art of language.

Outline of a Course in the Sciences of Language

For Children:—

The Art of Language in every grade and recitation (See Ch. XXVIII.)

A very little of the Science of Language, Grammar
(Taught as concretely as possible)

For the High School:—

Etymology

Grammar (Of several languages)

Rhetoric

THE TEACHER AND THE PUPIL

The Teacher's Duty. — In teaching any science, make everything as plain as possible. Put no artificial obstacle in the path of the pupil. No gymnasium exercises in thinking need be invented. There is enough productive mental toil to give the pupil all the exercise he needs. *But be sure that the pupil thinks.* Let the pupil tell the part of the subject that he knows and what he can infer of the yet unknown.

Get acquainted with the extent and organization of your pupil's store of knowledge. That is, find out what he knows and from what corner he looks on the world. Only then can you tell what mental food is good for him.

Demand the best of your pupil: the clearest ideas, the widest grasp of relations, the vividest conceptions of which he is capable.

The Pupil's Duty. — No one can think for a pupil. The teacher should think before him, but the teacher cannot think for him. In history, for example, he ought to find many *whys* and *wherefores* not developed in the text. He ought to find reasons for disagreeing with the text at times. In natural science his observation and reasoning ought to find much more than is set down in his textbooks. The teacher should require this independent work of the pupils and stimulate it by appropriate questions and demands. Mere worry-bobbing and guessing bees, however, are of no value; but on the contrary a waste of time and energy.

Exercises

1. Up to the present time how much of the geography that you studied in school has been of practical use to you?
2. After the teacher has explained a point in algebra, how can he find out if the pupil followed him and did his own thinking? In history? In botany?
Criticise the following method:
3. Teacher, concluding an exposition: "That is so; isn't it?" Vigorous nods by class.
4. How would you teach the multiplication table?

CHAPTER XXVIII

HOW TO TEACH AN ART

A FALLACY OF EDUCATIONAL THEORY

THERE is an educational fallacy, and a most deep-seated one, upon which much of the practical school work of to-day rests. This fallacy is: We must first know before we can do. We mistakenly suppose that the logical order is: first, a clear intellectual view of the whole subject, its whys and wherefores, its relations, reasons, and causes; then, a practical ability to do, to make, to produce that which we thoroughly understand. Furthermore, it is assumed that if the intellectual view is perfect, the practical ability is as good as acquired.

The opposite is in most cases the truth. *First do and then know.* The illustrations are innumerable. We breathe long before we know why we do so. If we didn't, we should never find out the necessity of it. We eat before we study the physiology of nutrition; we walk before we know the mechanics of the lever or the physics of stable equilibrium; we talk before we know grammar; we speak the truth and abhor a lie before we know any theory of ethics to justify such behavior; we see before we know anything of the mechanics of the eye or the science of optics.

On the other hand, the great military theorist may be a very poor general; one may know the whole science of music and not be able to sing or play; a knowledge of

physics will never teach a person to ride a bicycle ; one may know Latin grammar and not know Latin ; an expert in psychology, pedagogy, methods, and the history of education may still be an abominably poor teacher.

There is no intention of denying that in most cases the knowledge of the science is of value in acquiring the art. Other things being equal, he who knows the theory of education ought to be a better teacher than he who does not. In some cases, it may even be absolutely necessary to know a little of the science before the art can be attained at all.

But this is asserted with all possible emphasis : The knowledge of the science never gives skill in the corresponding art. The only way to learn an art is to practice that art itself. *Fit faber fabricando.*

Perfection in an art is attainable only by much repetition. The only way to learn the multiplication table is to repeat the multiplication table. The one method of learning division is to divide. If that does not help, divide some more. After you know enough of the " science " of division to know how to proceed, the only thing that will make you a better divider is to divide. Don't waste time reading about division. A deeper insight into the science of division will not help one whit in making you a rapid or accurate divider. If you don't know a solitary reason why you do as you do in division, this does not matter as far as your quotients are concerned.

The only way to learn French is to speak and read French. A slight smattering of grammar aids you in translation ; but do not delude yourself by thinking

that the study of French grammar has taught you French. You have to repeat every French word just about so many times before you know it; and every phrase or expression must be given the same treatment, even if you know every word of which it is composed. Repetition, and repetition only, will put you in possession of a new language. Reading about French in another language will never bring you one step nearer your goal.

The correct order is: first, the language, then its grammar; first, computation (the four elementary "rules"), the art of arithmetic, then the science of arithmetic; first, literature, then the philosophy and history of literature; first, practice in composition, then the science of rhetoric; first, the art of rational thinking, then logic, the science of thinking. I have no wish to deny that often it is best to sandwich art and science in the learning. Thus, there is no heresy in mixing grammar and language practice.

EDUCATION IN SCIENCE AND IN ART CONTRASTED

Education into Consciousness.—Education in a science is education *into* consciousness; education in an art is education *out* of consciousness. The first assertion needs no elucidation. A boy is educated in botany when his mind is enriched with botanical concepts, and the symptom that his education "takes" is that now he has fuller, richer, and truer ideas of the plant world than he had before. When he thinks of a gentian or a clover blossom, he has much more in his consciousness than he who is ignorant of the science of botany.

Education out of Consciousness. — But in reference to an art, the exact opposite obtains. When a beginner tortures a piano, her head is full of notes and flats and sharps and fingers and keys and “one-two-three” and pedals and expression and touch. When a master plays, his consciousness is free from all this. He thinks only of the music he wishes to produce, and the brain grooves do the rest. If we have to think how to spell a word, we don’t know how to spell it. We never think of the forms of letters when we write; but the child beginning to learn is painfully conscious of every curve. The experienced accountant glances up a column of figures and has the sum with scarcely any thinking; while the novice expends much cogitation on the same operation.

When an art is perfectly known, it is performed mechanically, that is, without any conscious direction from the mind. Hence we progress in our education in an art in proportion as we perform its operations with less and less thought. The more of a “thoughtless, parrot-like performance” an art becomes, the more completely it is mastered.

But the sum and substance, the alpha and omega, the core and essence, of all education in the arts, is *repetition, practice, drill, doing the thing itself over and over again.*

THE PLACE OF THE CULTURE AND ARTS OF CIVILIZATION IN THE SCHOOL CURRICULUM

All that is taught is either an art or a science or both. As the method of teaching an art is radically different from that of teaching a science, it

is worth while to distinguish carefully between arts and sciences.

The arts that should be taught to children and youths may be classified as follows:—

Intellectual Arts

Computation (the art of arithmetic)

Spelling (strictly one of the language arts)

The Business Arts (bookkeeping, typewriting, and shorthand)

The Mechanical Memory Elements in all subjects

Arts that are in about the same degree Intellectual and Æsthetic

Languages

Composition

Literature

The Dramatic Arts

Æsthetic Arts

Drawing and Painting

Sculpture and Other Plastic Arts

Music

Moral and Social Arts

Training in Moral Habits

Training in Good Manners

Manual and Other Physical Arts

Penmanship

Manual Training

Elementary Agriculture

Domestic Economy

Physical Training

Athletics

THE INTELLECTUAL ARTS

The art of computation in arithmetic and the mechanical memory element in other subjects have already been touched upon in this chapter; and brief mention will be made of the business arts in the next. A few

remarks on the teaching of spelling, however, may not be amiss at this point.

Spelling. — Use no rules; English spelling is too irrational to be benefited by rules. Besides, the art of spelling as an *art*, is not a science. An art is not learned by learning the corresponding science.

Spelling ought chiefly to be learned incidentally. Every lesson is a spelling lesson. In history and geography every new word arrived at should be spelled as well as pronounced by the pupil. Much written work should be required of pupils, and every written exercise is at the same time a spelling exercise. Many teachers have this practice: They correct the pupil's papers, and return them to him, and that is the end of it. This is a mistake. The pupil should be required to rewrite the exercise correctly. Sometimes it may be too much to require the pupil to rewrite the whole exercise; but the mistakes should all be corrected by the pupil.

English spelling is so difficult and our school conditions so far from ideal, that as yet the spelling class is generally a necessity. Just how much or how little is necessary in each school, each teacher must decide for himself. That writing is the most effective way of studying and reciting spelling is self-evident, since our practical use of spelling comes only in writing. Still, for the sake of variety, an occasional oral recitation may be tolerated.

THE INTELLECTUAL AND ÆSTHETIC ARTS

Language. — Language is, so to speak, the atmosphere of our intellectual and æsthetic world. Its importance can hardly be overestimated. *English*, our

national language, is the indispensable subject of instruction in our schools. No innovator has yet proposed its removal from the curriculum, which in itself is high testimony to its importance. Every class in the school should be a class in the art of using the English language.

Other languages should not be neglected, but they *are*. The United States and England are the only enlightened nations in the world in which a speaking knowledge of at least two languages is not common among cultured people. The finest, most volatile, most evanescent element of culture is preserved in its language. This is the element that cannot be translated, and it is also the most precious element because it so exquisitely expresses the inmost soul. The "natural method" is the only method of teaching language that is scientifically defensible.

Literature. — Literature is the greatest of all the fine arts, and in spite of the prominent position it occupies in almost every school curriculum, it has not yet achieved the place in the schools to which it is entitled.

There is now a body of real, classic literature for children, and it is increased every year. But in our schools we still have too much of the "Horses-can-run" reading material.

Oratory, or spoken literature, though not as lasting as letters, has a power and charm wholly its own, which is well worth the seeking.

Some Remarks on the Pedagogy of Literature. — Teachers should not shoot over the heads of pupils. Girls in short dresses are often fed on Milton's "Paradise Lost," and boys whose thoughts center on the foot-

ball ground, are bidden to seek solace for their aspiring souls in Browning. Such great masterpieces had better be unread than presented at that early stage of the pupil's education. Feed babes on milk!

Some teachers seem to think that the study of literature consists in finding the author infallible, and praising him for anything and everything. A slight adaptation of the well-known "sermon" on "Old Mother Hubbard" illustrates this method. "'To get the poor dog a bone.' Ah, the pathetic simplicity of that epithet *poor*! What a sensitive, humane soul our author must have had, to feel so deeply and express so exquisitely his sympathy with the lower creation! How this word of four letters puts the whole scene before us, as it were, in a nutshell; so much better than whole sermons could have done. And notice the author's self-restraint. While his heart was breaking for that 'poor dog'—ah, the perfection of that expression!—he does not allow his sense of artistic proportion to be dimmed, but limits himself with heroic self-restraint to *one* adjective. Less perfect authors would—etc." Depend on it, the pupils see through this unconscious insincerity.

A piece of literature is a *thought complex*, and as such must be studied as other thought subjects; but it is also a *work of art*, and as such it is the expression of the whole of the human soul in one of its moods, or emotions. It is not the expression of the emotion simply, it is the expression of the whole person as affected or dominated by that emotion. Like every work of art, it must be studied *synthetically*.

Here is where much teaching of literature fails. It

is analysis from beginning to end. One or two dramas of Shakespeare ground into grammatical fragments, half a dozen other representative selections from as many authors, all reduced to literary macadam — this is often called “ a liberal course in English literature ! ” Paragraphs, sentences, words are mercilessly cut to pieces. There are notes and dissertations on a semicolon or a syllable. All sorts of extraneous erudition is introduced, such as mythology, archæology, and biographical gossip. All of this is well enough in its place. This analytical study is the due of literature as a scientific subject. But after the analytical study is completed, the unit of literature should be studied as a *whole*, as a work of art. It should not only be *understood*, it should be *enjoyed*. Thus, it will produce not only learning, but culture.

Elementary study of literature should be extensive rather than intensive. One Madonna of the masters may contain more than your pupil of painting can ever get on the canvas, but that is no reason why the student should copy that Madonna to the end of his days. For the high school, one thoughtful reading of a literary masterpiece with just enough impedimenta of explanatory notes to make the meaning complete and clear is all that is necessary and valuable.

A Few Rules for Teachers of Literature. — Be sure that the literature selected is not above the ability and interest of your pupils.

Let them read much. In the high school, twenty pages a day is rather too little than too much.

Avoid all pedantry and trifling in notes and discussion. Aim at giving the pupils a clear conception of

the *purpose* of the author. Waste no time on by-paths.

To make literature a culture study, do not stop after having studied it analytically. When a selection has been thus studied, then is the time to read it for pure enjoyment.

Study modern authors first, and when the pupils are more mature, you can venture with them to literature of ages that differ much from our own in thought and feeling.

Composition. — Composition is an important element in a literary education. It is the art of producing literature, and should be studied by the average student for two reasons: (*a*) for its value as a practical art, to express thought and feeling in the ordinary business of life; and (*b*) for its value as a fine art, to express literary beauty. This, however, not for the purpose of producing immortal works of art, but to acquire the ability to enjoy literature.

Dramatic Art. — Dramatic art may be considered a sort of climax of the fine arts. As an *art* in the narrower sense of the word, it has no place in any but professional education; but for its *cultural* value every school should teach it. That is, we should teach our pupils how to enjoy and understand dramatic representations.

THE ÆSTHETIC ARTS

America has been notoriously tardy in æsthetic development. The great majority of us never spend one serious moment in the pursuit of the beautiful. When we get rich and decide to acquire culture with our new social position, we go to Europe, buy paintings war-

ranted to be genuine, and think we have a love for the fine arts. We yawn through Italian operas of which we understand neither the words nor the music, just to show that we are æsthetic. (But when we really want fun, we go to a football contest or a minstrel show.)

A few of us take this matter seriously — very seriously. We try to force the plant of taste by hothouse methods. Thoroughly distrusting ourselves, we dare not have an æsthetic opinion of our own, but meekly subscribe to what the authorities tell us is beautiful.

Drawing and Painting. — Though children, and particularly boys, have only a very rudimentary appreciation of the beautiful, still they can begin early to acquire the manual, vocal, and sense skill — the *art* — necessary to bring beauty into their lives. A child can profitably begin to learn to draw two or three years earlier than he learns to read and write. The pupil should be allowed to color his drawings from the first. Painting is not sacred to adults. Children ought early to be taught to see colors; and painting is the best method of teaching colors. They should not be required to draw and paint unless they have something to draw and paint, and some reason for picturing it. When they reproduce stories, they should illustrate them. When they study a plant or an animal, they should draw it. They will be delighted to illustrate their reading lessons.

In this, as in every other art, exactness should not be required of children. Children have a right to be inexact, to blunder, to make daubs and scrawls. But the teacher should require constant *progress toward* exactness. In order to do this intelligently, it is necessary

for the teacher to know the exact attainment of each pupil; for what would be commendable progress in one may be mere carelessness and listlessness in another.

Music. — The time to teach the elements of both instrumental and vocal music is childhood, and the place should be the public schools. Very few people are unable to learn to sing, if drill is begun in childhood.

The Fine Arts as Culture. — The technique of *drawing, painting, modeling, and music* should be taught to some degree in our schools; but the emphasis should be placed on the *culture* element. The pupil should be trained to appreciate and enjoy the beautiful in these forms of art.

As culture the fine arts have a wider mission than as art. Few can become artists in music, painting, sculpture, or acting, but all should learn to appreciate and enjoy art.

In music practically nothing has been done in our schools to teach appreciation. Many graduates from conservatories do not enjoy the very compositions they are playing, but become animated automatons who enjoy only their own mastery of the technique. But appreciation of music *can* be taught. Tell the learner *what to listen for*. Sandwich music and explanation. Give the theory and the mechanics of different musical compositions, play them in sections, with explanations between, and finish by playing the whole selection.

Children should early be taught to appreciate painting and sculpture. The mood of the artist, his peculiar social and intellectual environment, and his purpose

should be clearly before the pupil. Thus, to understand Greek art, let us look at the frieze of the Parthenon. Cast away your theological, philosophical, and social speculations, and look at it as the Greeks did, as the spectacle of the perfect animal. Then you will begin to understand the poetry of motion, the joy of full, free, and healthy muscularity, the intoxication of oxygenized blood in cool, exulting limb, and crisp-pulsing heart.

Good Taste. — We have no name for that fine art which clings closer to the individual than any other, and which more definitely than anything else stamps its possessor as cultured. We mean the display of *good taste* in dress, home, and everyday surroundings. But to impart this culture is one of the great objects of education. This art is learned by imitation, mostly unconscious.

SOCIAL CULTURE

Not long ago the scholar was supposed to be a recluse from society. This was not good either for the scholar or for society. A very important art is this of getting along with the minimum of friction and the maximum of enjoyment with our fellow men. Perhaps it is not a school study. Perhaps it is best "picked up" as occasion offers. Certainly very few, if any, set lessons should be given on this subject in our schools. But we should preach by our practice.

Social culture cannot be acquired by reading about it, talking about it, or speculating about it. Culture is an art, and like every other art it comes only by practice, drill, and tireless though tiresome repetition.

Outline of a Course in the Arts for Elementary Schools*Computation*

(Accuracy and reasonable speed in addition, subtraction, multiplication, and division of integers and fractions)

The English Language

(Speaking, reading, spelling, and composition)

One or More Languages in addition to English

(Taught by the natural method, mainly orally)

Literature

(That the child can and should appreciate)

Music

(Singing, note reading, and the rudiments of the art of playing some musical instrument)

*Drawing, Painting, and Clay-modeling**Penmanship**Manual Training*

(In woodwork [sloyd])

*Elementary Agriculture**Domestic Economy*

(For girls)

*Physical Culture**Training in Manners and Morals***Outline of a Course in the Arts for the High Schools***English Language and Literature**Two at least of the following: —*

German Language and Literature

French Language and Literature

Other Modern Languages and Literature

Latin Language and Literature

Greek Language and Literature

Music

(With the emphasis on learning to appreciate music)

Drawing and Painting

(To teach the pupil to understand and enjoy art)

*Manual Training**Elementary Agriculture**Domestic Economy*

(For girls)

*Bookkeeping and Typewriting**Physical Culture**Athletics*

(Including outdoor sports)

*Social Culture**Moral Training***Exercises**

1. What portion of the time you devote to the study of Latin is spent in studying Latin, and what portion to studying about Latin?
2. Should a pupil-teacher study methods first or do practice-teaching first?
3. Why is it not wise to call the attention of a class to a misspelled word on the blackboard?
4. Name an English classic suitable for use in the first grade; in the fifth grade; in the eighth grade.
5. Would you teach your pupils to sing first by note or by rote?

CHAPTER XXIX

THE PEDAGOGY OF TECHNICAL HABITS

SINCE the downfall of Greek civilization, the right of hands and feet to an education has not been recognized by society until our day. That the whole body has a right to training, to civilization, is so self-evident that it should need no defense.

PHYSICAL EDUCATION

The Neglect of Physical Education in the Past. — It is disturbing to think that until our day, and yet to a great extent, for that matter, learned minds were allowed to sojourn in perfectly uncultured, almost imbecile, bodies. The professor, or doctor of divinity of fifty years ago, had, stuck into his long coat, a skeleton with appurtenances that barely knew how to exist. It was an idiot's body. He could walk after a fashion, and push food into his mouth in some way, and tie a cravat — and that was all.

Well, why not? These men had specialized in other kinds of culture. They had not time to educate the muscles. Had not they as good right to be ignorant of skating and whittling as the mechanic to be ignorant of the Odes of Horace?

The Value of Physical Education. — Let us see what they lost. First, they sacrificed health. A certain

amount of exercise and oxygen are necessary for the health of the human system. It is, of course, possible to get exercise and air without systematic training of the muscles; but there is no reason why we should not kill two birds with one stone.

Furthermore, it is impossible to think perfectly without trained and experienced muscles; for one thinks with his whole body. When you imagine vividly an army charging, there is a distinct sensation of marching in your legs. Now, if you have never marched and don't know how to march, the twitching in your members will bear very little resemblance to the real experience. You cannot imagine a charging army and get life into your thoughts. "Stem the tide" means very little to him who has not forced a skiff against a brisk current. The boy who has sawed, planed, and whittled oak, can appreciate what is meant by "heart of oak" better than he to whom *oak* is just three letters of the alphabet. The human being is a unit. Other things being equal, he who can shoot straight can think straighter than he who is a poor marksman.

Physiologically, we really do not train the *hand* by manual training, but the nerve centers that control the hand. Psychologically, skill, even of the fingers and toes, resides not in the body but in the mind. The investigations of physiological psychology have shown that in all probability the same event takes place in the brain when we think of an action as when we actually do it. The only difference is that in the former case the neural current is inhibited before it reaches the muscles. Hence thought is abortive action. From

this it is plain that the mind is not fully educated until it is in a trained body.

To those pupils who later in life join the ranks of manual workers, whether skilled or unskilled, the education of the muscles is plainly of the greatest practical value. The highest educational reason for muscular education is, however, simply this: Education should be a development of all the powers of man. Education should put us in possession of our whole being; and to do this we must be able to use our muscles with skill.

Athletics and Physical Culture. — Athletic skill ought to be a part of every education. Every one should be taught marching, running, jumping, swimming, skating, wheeling, boxing, fencing, rowing, the principal athletic games, and the simpler forms of apparatus gymnastics.

The wrong spirit dominates our athletics. All we are concerned about is to beat somebody. Hence only those with unusual talents in this direction give much attention to gymnastics. Again, as long as we can do certain feats successfully, we care little *how* we do them. Ease, grace, and command of the muscles should be our first aim. Each person's purpose in athletics should be to gain dominion over himself, not primarily "to beat the other fellow."

The most beautiful object in the whole world is the human body. But the human body is most beautiful when in beautiful motion. Even a plain person with grace of movement becomes a thing of beauty. The art of good carriage, of graceful pose, of becoming movements, may be called *physical culture*. We habitually

underestimate its value. It is our duty to be healthy, strong, and skillful; and it is just as much our duty to be graceful.

HOW WRITING SHOULD BE TAUGHT

The results of child study show that civilization forces writing upon children at too early an age. Before eight or ten years, the child's muscles and fingers are not sufficiently developed to hold comfortably so small an object as a pen and to make so exact a figure as a letter of ordinary script. Nor are the eyes ready to distinguish such minute objects as those of the "copy" of the ordinary writing book.

If our school system were fully rationalized, there would be no need of teaching babes under eight years the art of writing. But as it now is, a teacher who is in the system cannot do altogether as she pleases. She must teach reading and writing to the first and second grade. If, then, writing must be taught, the best thing to do is to make it mainly a blackboard exercise and require beginners to make large letters, even on paper.

The ideal teacher in the ideal school would teach writing only incidentally. She would never have a class just in writing. When her pupils had anything to say and she or they preferred not to use oral language, they would write. Whether this writing were geography or history or letters, the pupils would take pains to put it in their best hand, and the teacher would be there to direct the exercise and give instruction in the art. But we are a long way from the ideal yet. As our school programs are arranged at present, there

would often be absolutely no chance to give any instruction in the art of writing, if there were no special period set apart for it. Still, copy-book writing should be made a very subordinate subject in the course.

The main things for the teacher to remember in reference to writing are the following:—

Never allow the pupil to write in any other hand than his best.

The characteristics of good handwriting in the order of their desirability are: legibility, rapidity, beauty. There is a long distance between each of these.

The position of the body in writing should be such that it can be maintained by an adult for ten hours a day without injury and discomfort.

We shall not enter into the merits of the dispute between the “verticals” and the “slants.” Suffice it to say that the war has brought out in strong relief these three principles: rounded forms are more legible than elongated forms; beauty is secondary to legibility; and the simplest form of a letter is the best, as every flourish or embellishment decreases legibility.

MANUAL TRAINING, SLOYD

The last word on manual training as pedagogical material has already been said by Professor O. Solomon of Nääs, Sweden. We can do nothing better than to sum up his conclusions here.

The aim of manual training in children's schools should be to help to furnish a well-rounded, all-sided culture, not to teach any particular trade. The sloyd teacher should aim at developing a cultured human

being and not primarily the ability to make shoes, bricks, or furniture.

How the Pupil should be Taught. — The children should have a natural interest in their work. Hence manual training should not consist in going through unproductive exercises with tools, as for example planing a smooth surface, boring holes, sawing off boards square ; but the pupils should from the very first make something useful. What a pupil makes should become his property.

The ornamental should be subordinated to the useful. We shall never have true art until we recognize that the true function of art is to beautify the useful. When a people is truly artistic, its kitchen utensils and everyday garments are beautiful and none the less useful. So, as a rule, children should be restricted to what is useful in their sloyd work ; but they should be taught to make the useful as beautiful as possible.

The teacher should not do the least bit of the pupil's work for him. If the pupil needs direction, the teacher should not touch the tool and material of the student, but should take another tool and another piece of material and give the necessary sample of work.

It is doubtful if pupils' work ever should be placed on exhibition. The *work*, not the *products*, is what is of pedagogical value ; very often the most finished product is the result of the most vicious pedagogical work.

INDUSTRIAL EDUCATION

Childhood not the Time for Technical Training. — Draw the sharpest line possible between sloyd (manual training) and industrial education (instruction in the

trades). It is the acme of false pedagogy to teach a trade to a child. Every consideration is against it. In most cases it is impossible to tell for what trade a child has the greatest aptitude. The muscles and the nerve centers of the child are not sufficiently developed to admit of such exactness of movements as are necessary for the highest workmanship in most trades. More than that, it is well established that training which forces a high degree of technical skill prematurely upon a child is distinctly injurious to him, retarding complete physical development.

But the weightiest reason against teaching trades to children is that childhood should be sacred to the full and symmetrical development of the whole human being. Primarily, the teacher's duty is not to raise lawyers, physicians, tailors, barbers, and paper hangers. His duty is to develop men. It is inexpressibly sad to hear the sordid standard of "earning capacity" made the standard of education. Not long ago I heard a very prominent politician speak on this subject, and after saying that the school should train for life, in the same breath he gave as a synonym: "Any school study which does not help the pupil in making a living is useless." Now, with all deference to the high source from which this sentiment came, he could not well have expressed a more vicious heresy. He assumed that the whole duty of man is to earn money. If it is, let us tear down our school walls, and send our children to the mills.

Let us cease a moment from our money madness. The chief end of man is not the weekly reception of a fat pay envelope, correspondence-school advertisements

notwithstanding. The chief end of man is to live the noblest, richest human life possible. For this he wants spirit, mind, and body as highly and as symmetrically developed as possible, and harmoniously adjusted to his environment. Childhood and at least the early teens are not too long a period for this all-sided development.

But even according to the sordid standard of wage-earning capacity, the wise course is to postpone technical education and instruction in the trades until childhood and adolescence are passed. There is no better basis for the production of mechanic or craftsman than a healthy and symmetrically developed individual. The wide-awake boy who has found himself and who has himself under perfect control will in a year become a vastly superior workman to the lopsided and mentally dwarfed individual who has been trained in a trade since childhood.

Occupations for life cannot safely be chosen for children. If the choice made by or for them while they were children had been final, the lives of our great men would have been very different. Linnæus, the world's greatest botanist, would have been a shoemaker, Washington a sailor, and Jim, the ragman, would have been President of the United States. If boys chose for themselves, the world would soon consist only of sailors, policemen, and chauffeurs — with a flying-machine operator thrown in — or blown in — here and there.

The Right Kind of Industrial Education. — But for all this, we need industrial training in the grades. Sloyd in wood and metals, elementary agriculture, and

domestic economy should be taught in every elementary school that has the funds for it.

Education may be defined as adjustment to environment. The child should be so adjusted to his environment — the world of nature and the world of man — that he can live the richest and most harmonious life. There is no objection to vocational teaching, *whenever this can be done without diminishing the central purpose of the school*. In other words, whenever the so-called practical subjects really *educate* in the broad and true sense and not merely train for some occupation, there is no better subject for our schools than these same practical subjects.

The main object, then, of industrial or vocational education is to make the school a part of the living, throbbing life of the present and not allow it to remain an artificial and detached world of its own. Education, even elementary education, should not be a side show, but should be right in the main tent of life.

ELEMENTARY AGRICULTURE

The traditional school curriculum has connected beautifully and naturally with city life, especially with sedentary occupations. The country, with all its wonder and beauty, has been left a *terra incognita* to the student. The educated farmer has lived a double life. While he has known something of the siege of Troy, he has been sublimely ignorant of the wonderful epic of natural forces continually going on upon his farm. He may have known something of chemistry and botany, but it is a safe wager that not once a month did he meet any of his book-and-laboratory science in field and

stable. On school subjects he was modern, scientific, progressive; but he ran his farm by rote, and was content to travel on as a farmer in the rut of his forefathers.

Now, this is all wrong. Education should adjust the child fully as much to country life as to city life, since nearly two thirds of us (in the United States) still live in the country. What we need is a course that trains for country life, and connects naturally with life in the open, in close contact with the soil and nature. This rural education should open the eyes and the heart of the pupil to the beauties and opportunities of country life. It should make him an acquaintance and a friend of the animals of the barnyard and the plants of the cultivated field. It should teach him to find himself, get command of himself, in free, vigorous outdoor occupations. The school in the country should be itself a bit of country life in natural and intimate connection with its environment; not, as is now so often the case, a bit of city life that is mislaid in alien surroundings.

Agriculture for the City Child. — And if in spite of this alluring introduction to the charms of country life the country boy goes to the city as he sometimes must, he will have no reason to regret his rural training. Sedentary life is after all a violently unnatural form of existence; and now we are pretty well agreed that no one should attempt such a life without long and frequent visits and vacations spent in the country. His rural education will teach the city man what to do with his sojourns in the country. Now, it is often pathetic to see how alien the country is to the city-bred person.

Watch a company of city people on an outing near one of the beautiful Minnesota lakes on a glorious day in June, with the fish biting and the water just right for swimming. What do they do? Guess! Why, they sit all day in a stuffy little summer cottage, playing cards. They have no rural education. This is why I never could see any sense in restricting a course in rural education to rural districts. The city child needs it just as much. By all means, when possible, have such courses in the cities as well as in the country.

Agriculture for Girls as well as for Boys. — It is customary to add that these courses in agriculture are for boys only. Here is another place where the old heresy crops out. The idea is that since the girl is not to work in the fields after she is grown, it would be a waste for her to study agriculture. Let us get rid of this notion that in teaching what is called agriculture in the grades we are teaching a trade. We are not. The girl needs an introduction to country life as well as the boy. Our attention is often called to the fact that no class is more frequently represented in the insane asylums than the farmer's wife. Why? She lives in an alien world in which she has no interest, that *means* nothing to her. Intellectual and emotional starvation is what is the matter with her. By all means, educate the girls as well as the boys in your agriculture classes to appreciate rural life.

Teach agriculture by all means. Teach it to all your pupils, both girls and boys, to the future lawyer and banker, no less than to the future farmer. The science of agriculture is simply botany, zoölogy, mineralogy, chemistry, physics, and geography viewed from their

most interesting side; for it is the side that is in closest relation to us, that *pertains* to us, *touches* us. Hence the agricultural part of these sciences is precisely the most educative portion, for it can be assimilated into the lives of the pupils. The art of agriculture should be practiced in all schools that have facilities for it; for next to wood sloyd no industrial employment gives more varied and healthful exercise, and is more suited to the needs and abilities of children. As the object is not to teach the trade of farming, there is nothing lost but much gained by having the future banker and factory hand raise beans and graft apple trees.

DOMESTIC ECONOMY

Cooking and the care of a house are also subjects which have a great educational value. As the great majority of women are destined to perform such work in later life, the utilitarian argument applies here as nowhere else. Instruction in cooking ought to tend towards raising the health average of the race in a double measure; it should provide healthful physical exercise, and also improve the hygienic character of our meals. Domestic economy should teach the pupils that the world of the sciences and the books is precisely the same world as that of the saucepan and the broom.

SEWING

Sewing has not as much to recommend it as a school exercise as cooking. As a fine art, it comes nearer to being inspired by vanity than any other (including under sewing, embroidery and lace making). If our girls should go to their graves ignorant of the gentle

art of taking certain stitches and doing certain kinds of crochet work, neither they nor the world would be very much the worse. The elements of sewing can be taught by most mothers; and for that matter, its rudiments can be "picked up" by any intelligent girl. There is evidence that even the bachelor will qualify upon proper provocation. Worst of all, sewing is a monotonous and unhygienic occupation. There is no appreciable muscular exercise in hand sewing; and the constant temptation is to assume a stooping posture, very detrimental to the health of the lungs. As it is a sedentary occupation besides, it is worthless as a corrective of the sedentary nature of book work. Still, dressmaking is an important art, and of great practical value to most women; and if a place can be found for it in our crowded curriculum, it is certainly a valuable addition; but care should be taken to prevent unhygienic effects.

COMMERCIAL SUBJECTS

Many subjects of commercial education can defend their place in a high school course. Bookkeeping is as educative as cube root or percentage. Typewriting and shorthand have nowadays a fairly universal usefulness.

Our schools, then, will be distinctly enriched by the addition of agriculture, sloyd, domestic economy, and a commercial course. These subjects will be practically useful to some of the pupils in after life and educative to them all. Best of all, the introduction of these subjects will make the school a part of the life of the community and of that larger life into which the pupil is soon to enter.

Exercises

1. Distinguish between the following: manual training, industrial education in trades, technical education, gymnastics, athletics, calisthenics.
2. How can school athletics be made to contribute to raising the physical development of every student instead of giving abnormally great development to a few students in a few lines of physical development only?
3. How would you teach a pupil to appreciate to the full the motor element in literature?
4. What should be the aim of physical culture?
5. Outline a course in the arts of agriculture and horticulture for a country elementary school; for a city school.
6. How could a course in the art of cooking be made to solve the problem of a midday meal for the pupils while at school?
7. Illustrate from literature the old and the new conception of the physical development of the scholar.
8. Outline a course in sloyd (manual training), agriculture, domestic economy, and physical education for the grades and high school.

CHAPTER XXX

EDUCATIONAL REORGANIZATION

IN the past the schools have been the citadel of conservatism. The schoolmaster and the professor ate the bread of the government or were pensioners of the privileged classes, and it behooved them to champion tradition and vested interests.

But times have changed. Progress is in the air, and in no profession is the innovator more honored than in ours. Most of our late educational reformers, however, exhaust themselves in denouncing what we have. One of the notable exceptions is Dr. Maria Montessori of Rome. The wonderful results she has obtained have attracted the attention of educators to such an extent that her methods are now being tested in almost every civilized country.

THE MONTESSORI METHOD

It is impossible to study the work of Dr. Maria Montessori without recognizing her genius and her magnetic personality. The greatest thing in the Montessori movement is Dr. Maria Montessori herself.

The basic principle of this method is the best established conclusion of modern psychology: Man is primarily an organism that reacts to stimuli. Hence the first business of the nascent human organism is

learning to use its senses (which receive stimuli) and to coördinate its motor reactions. That is, sense training and motor training come first and foremost in human education.

The tactile and motor senses are primary. Develop them first ; and train eye and ear only in closest dependence upon them. The world as we see it is built up on the framework of the world as we have handled it with our hands. Therefore, if we have not handled and touched things sufficiently, our perceptual world, vision included, is uncertain and unsound. A solid is primarily something that can be handled. A surface is in origin a touch sensation. Hence let the child touch, handle, and make things first, and thus get a vital acquaintance with them, and then afterwards recognize them by sight and hearing alone. The pupil should study the world with his fingers and hands first, next and secondarily with his eyes and ears. This is the true pedagogical order, and on this psychological basis Dr. Montessori has built her system.

Sense Training. — A large part of the sense-training apparatus consists of blocks of geometric forms that fit exactly into a series of holes. Some of the exercises consist in fitting these insets into their proper places. Bobbins with colored yarn are also to be arranged according to color and shade. Most of this work can be done without the intervention of the "directress," as the teacher is called.

As typical of the work of the directress, we may cite the teaching of the names of colors. She shows the red yarn and says, "This is red." Then a contrasting color, as blue, and says, "This is blue," and so on.

Then the exercise is reversed. The child is asked, "What color is this?" and if he answers correctly, the directress goes on with her questions; but as soon as the child makes a mistake, the teacher "smiles" and drops the exercise without correcting the error, — this on the theory that a correction would be quite as likely to fasten the error in memory. The Montessori method was first devised for defective children, and in their education this last rule is probably valid. But it can scarcely be doubted that with normal children immediate and direct correction of errors by the teacher is the most economical method.

For children who come from the poverty-stricken tenements of the great cities, as the majority of the children in the Montessori Children's Houses do come, and even for the city child from the middle-class home, these apparatus exercises are a great improvement on his former touchable and graspable universe. For "Hands off" is the melancholy motto of the city child's world. A Montessori Children's House is a paradise for the touch-hungry city child; but it is questionable whether it has much to offer the country child in sense training.

Motor Training. — The other half of this earliest education is motor training, — exercises to establish muscular coördination, or, to be more exact, coördination of reaction paths in the nerve centers. Every Montessori exercise involves motor activity, but some are especially designed for motor training. Among these we find the ancient art of pottery, in this case a glorified mud-pie baking and modeling in clay, including the making and use of bricks.

The children are taught to be self-dependent and self-sufficient in their personal routine at a surprisingly early age. They wash and dress themselves and keep their belongings and the school utensils in order. To do this they are given lessons by means of a special apparatus in lacing and buttoning shoes and clothes. They are also taught to set the table and serve meals, — this both as social education and as sense and motor training. Four-year-olds do this work perfectly.

Social Education. — Politeness and good manners are insisted upon everywhere. Easy, graceful motions, proper carriage of the body, and clear, modulated voices are results achieved at a very early age.

In self-help, manners, and deportment we find the most beautiful work of the system. Dr. Montessori has demonstrated that even before the age of five years a normal child can and ought to dress himself and conduct himself at the table with the same propriety as a grown-up.

Exaggeration of the Value of Early Training. — Dr. Montessori puts a tremendous value on early sense and motor training. For example, she expresses the conviction that naughtiness of children consists mainly in imperfect motor development, and says it is a well-known fact that a foreign language cannot be perfectly acquired, nor a patois or dialect entirely eradicated after the seventh year. This latter contention is demonstrably false. Any time before adolescence a normal individual can acquire a new language or dialect perfectly.

One can hardly escape the conclusion that Dr. Montessori's argument confuses two radically different

stages in sense training. The training of the sense organs themselves, to be wholly successful, must occur in early infancy. Happily, few adults have deficient sense organs because of insufficient exercise in infancy. The *apperceptive* training of perception (which is what the Montessori system provides), while possible and profitable both earlier and later, has its most remunerative period of training in *later* childhood (from eight to fifteen years of age).

The fundamental motor reactions must be learned and coördinated in early childhood. Normally, we establish during our first three years the ideomotor associations for every elementary motion we are ever to make. The earlier we study a language, the more easily we acquire it.

But there is danger of overtraining not fully developed muscles. Fine and exact coördination of movements may stunt the growth of the system. Many of the Montessori exercises are suspiciously complex and refined for immature bodies; and it would be rash indeed to assert that such training cannot be harmful.

Practical and Dynamic Interests. — The young child (the child under seven years, approximately) is ruled by two classes of interests, which we may here call the practical and the dynamic. The first class he has in common with us all. He engages in certain activities because he wants the results. He hunts the squirrel because he wants the squirrel. He harnesses the dog because he wants the dog to pull his sled. But he has another interest that is almost atrophied in the adult, — interest in an activity for the activity's own sake. He

runs and shouts and whistles just because it is fun to run and shout and whistle. He is interested in almost any exercise of his motor powers. Hence a purposeless exercise, like fitting cylinders into holes, may be exceedingly interesting to him.

When we perform an action with interest in the result, we do not care to repeat. The interest in the action is gone when the purpose is gained. Hence drill is tedious to the older student. But as the child may be interested in the activity itself, it follows that within the limits of fatigue, repeating the exercise repeats the enjoyment. The result is that children are easily and naturally interested in any exercise of which they are capable. The interest is enhanced if the exercise is rhythmic; and generally, its difficulty is the measure of its interest.

Whence it follows that the artificiality and purposelessness of most of the exercises of the Montessori system cannot be urged *per se* as defects.

But two is twice one. It is better to unite the practical and dynamic interests wherever possible. Such is nature's way. Spontaneously, naturally, the child's efforts are in most cases first practical, and only after skill has been won for practical purposes are the motions repeated for dynamic pleasure. The child struggles to talk because he wants to say something, but when he has mastered a word, a phrase, or a sound, he loves to repeat it dozens of times for the mere dynamic pleasure of using his vocal organs and of hearing himself speak.

Hence the more the educative exercises can be connected with the practical interests of childhood, the

better. In this respect the Montessori system is certainly far from the ideal.

Teaching Reading and Writing. — The Montessori system comes to its technical zenith in teaching reading and writing.

When the children have played with insets until the geometric solids are familiar to them, metal circles, triangles, and the like, with a button in the middle of each for lifting, are supplied. By drawing around these, the pupil gets plane figures, and his attention is called to lines and angles. He shades and colors these figures, and thus learns to see and feel plane figures.

Next he is given an alphabet of sandpaper letters. These he studies by touch, then traces. While touching, tracing, and handling these letters he learns to call them by the sounds they represent. Then he builds and recognizes words. Sentences and phrases come of their own accord next; but still, as Dr. Montessori observes, he has not used written language, for he has never tried to express his own thoughts by that means. But some day he explodes into written language. He is surprised that he can write and read.

The advantage of this system, upon which the author seems to put the emphasis, is that the children learn written language without knowing it and without any conscious effort. They grow into reading and writing just as they acquire teeth or freckles or anything else natural and inevitable.

For a practically phonetic language like the Italian, the technique of this system is perfect. Derived from the method used for feeble-minded children, it is so

arranged that written language is attained with the smallest possible expenditure of mentality. The normal child cannot avoid the trap. It is inevitable. The least wriggle of his soul will start him sliding on the inclined plane towards writing and reading.

But is the whole of this process, with all its complicated details so laborious for the teacher and so hard if not impossible of application to large classes, necessary for the normal child? Can he not take a steeper grade?

In contrasting her system with the ordinary one used in the Italian public schools, Dr. Montessori intimates that their method is wearisome and slow. Perhaps it is. But in a good American primary grade learning to read is enjoyed by the pupils, and they learn to read soon enough. In fact, as to speed in the mastery of written language, I doubt if the Montessori system can equal the Ward method or that of the "Progressive Road to Reading."

Certainly, let children learn to read as soon as they desire it, even if only three or four years old. But do not imagine that it is of any great advantage to the child to know this art so early. Very little practical use of it is possible until after his eighth year.

However, the consummate art of Dr. Montessori's method of teaching graphic language repays study both from the viewpoint of psychology and pedagogy; and poor indeed is the teacher who cannot get suggestions for the improvement of his own method from a critical study of this technical masterpiece.

No Literature. — Literature has no place in the Montessori system. Myths, folklore, and fairy tales are

banished. It seems as if the spirit of the drab, practical common sense of modern industrialism had so permeated the modern Italian philosopher's system that she finds no place for what is not matter-of-fact. Her claim that the literary element, from Mother Goose up, tends to confuse and bewilder the child can scarcely be established. It is unnecessary to criticise this point, for we are not likely to impoverish our primary education by following her example.

Spontaneous Self-direction of the Child. — That all which does not come from the spontaneous activity of the child is of evil, is to Dr. Montessori not simply a doctrine but an axiom which she never tires of repeating and never tries to prove. She has indeed reduced this to an absurdity. To follow her theory consistently she should substitute a wax figure for the directress, because a wax figure could do nothing so much more gracefully than a mortal.

Now, how is the illusion produced that in this system the child's actions are all spontaneous, self-directed and the result of his own initiative?

First, by exercises that must either be done right or not at all (Nothing but the right inset will fit its place); then, by limiting a child to doing a certain exercise or doing nothing; and finally, by making all exercises appeal to the dynamic interest of the child.

But plainly, in all this the child is led, if not by the nose or the hand, still by just as unmistakable direction as if the teacher had put the information and command into a spoken sentence.

Nor is it certain that by concealing the purpose (as is done in teaching reading) the pupil's sum total of

pleasure is increased. There is also joy in anticipation, and I am inclined to think that such "linked sweetness long drawn out" totals more than the spasm of joyous surprise.

The Silent Directress. — As we have seen, to be perfectly consistent with its theory, the Montessori system does not admit of a teacher at all. Since every direction by another is an infringement of self-direction on the part of the child, there is no place for even a monosyllabic directress. But here we must prefer Dr. Montessori's practice to her theory. The true function of the teacher is to stimulate and direct the intellectual, emotional, and motor activities of the pupil. Perhaps the most common mistake of the inept teacher is that of *doing* the work for the pupil instead of merely *directing* the activities of the pupil. The voluble teacher is particularly in danger of thus failing. But teaching is by no means such a simple business that it varies in excellence always in inverse proportion to the number of words used. In fact, it depends not at all on *how much* but entirely on *what*, and *when* the teacher speaks. The vital question is: Do the pupils react normally? If they do, they will develop normally. The teacher's business, whether he does it by few or many words, is to furnish the appropriate stimuli and directions. Whether the stimuli and directions consist in a self-explanatory apparatus or in the words of the teacher matters not; that stimulus and those directions are best which most economically and naturally secure the desired reactions from the child.

The Government of Children. — In practice the Children's Houses are distinctly institutions of social

education; but the theory is an unqualified individualism. Theoretically, the child is not to be governed. There must be no imperative mood, no compulsion; the child is never to be coerced. Over and over again Dr. Montessori insists that the child should be reared in "liberty," and not only does she not qualify this principle, but she asserts that if only complete liberty is given, all problems of government and discipline will solve themselves.

Let us advert a moment to fundamentals. Man is a social animal. One half at least of the educational program is to fit children for their place in human society. The fundamental lesson in this connection is that of obedience. Children should find out, and they should find out early, that the universe was not constructed primarily to satisfy their whims. Class work has this inestimable benefit that it teaches the individual that he has a larger self, — the social self. Obedience to the common will by following a common program is another of those blessed "tyrannies" of the schools. Man is an individual, and he is a social being. Neither of these should be sacrificed. He should be a strong individual and also a wholly socialized being.

There are three possible relations between society and the individual. (a) First, they may be in enmity. This means tyranny or anarchy. This was the condition in the old English boarding schools, as we see it in "Tom Brown at Rugby" and Kipling's "Stalky and Co." The best to be hoped for was a truce. The two belligerent powers might at best view each other with respect; and certain laws of war were observed.

(b) The second relation is that of compromise. The individual and society have each their separate spheres, and neither must infringe on that of the other. This seems to be Dr. Montessori's creed, as it was that of Rousseau and the majority of the pre-Revolutionary French philosophers. But this gives only a dead mechanical view of human relations. (c) The third relation obtains when the individual can find his highest development and his only true freedom in loving harmony and loyal obedience to society. By subordinating himself to the school, the pupil loses nothing; he gains everything. He is not to give up his own will, nor even, finally, to limit it. He is to find his own true will in the common harmonious will of the institution.

A fine example of unconscious humor is found in Dr. Montessori's sweeping declaration of the liberty of the pupil to follow his own initiative unhampered by teachers and rules, followed a few pages farther on by a detailed program of a day's work. Evidently if John wants to play with insets when the rest are serving dinner, he — but here either the program or the principle will be fractured.

The discipline in the Children's Houses must be, after all, just what we have had for a generation in our best American schools. There is compulsion and restraint, but the vast majority of pupils are very seldom conscious of either. The child must act not as he will but as the school wills; but school life and child nature are so well harmonized that the pupil is simply obeying his own better self. There are practically no punishments in the old sense. How much

corporal punishment is meted out in the primary grades in the United States?

THE BOY SCOUT MOVEMENT

From Froebel to Montessori the emphasis has been placed on the education of early childhood. Comparatively little has been done for the most critical period of development, early adolescence. And yet for character and culture, for individual development, and social progress the education received during the last years of childhood and the first of adolescence, from about the twelfth to the eighteenth year, is worth more than all that came before and all that can be given afterwards.

Character is a by-product of our self-directed activity. It can be produced in no other way. The modern boy and girl moving along the smooth and narrow channel of school and home life have not much chance for asserting their moral individuality. All is foreordained. But in General Baden-Powell's Boy Scout movement the boy is trained in self-reliance, individuality, courage, initiative, and moral fiber at the same time that he is trained in loyalty, obedience, and the spirit of comradeship. In my opinion this is the finest school for character yet devised. The wood lore and field lore, the training in camp life and in what to do in cases of emergency and accident are also invaluable.

The Boy Scout movement supplements precisely the cardinal defect of the school-room-and-school-book education. Here is direct contact with nature, motor education, initiative, a field for the exercise of moral responsibility and self-reliance.

The organization of the Camp Fire Girls, — the feminine branch of the movement, — is not so far advanced, but has the same promise.

The problem of this movement is how to weave it into our social fabric and how to establish it in harmony and coöperation with the rest of our educational system. Here is constructive work worth doing.

THE REORGANIZATION OF THE CURRICULUM

The Education of Infants. — Since the country has so many good things that the city lacks, such as fresh air and plenty of space, some one has sapiently asked, "Why not build the city in the country?" Allow me to reverse that proposition. Why not import a bit of children's country into the city? But I am forestalled. It has already been done. The modern playground, scientifically equipped and managed, is just such a bit of children's country, and needs only to be enriched and enlarged to be ideal. Let us call this enriched playground the *Children's Estate*. Let us add domestic animals, as cows, ponies, burros, sheep, goats, cats, dogs, and chickens. It should contain a piece of wild woodland where the child can absorb wood lore with oxygen. Let each child have a plot of arable ground for flowers and edible vegetables, which he may plant and care for under the direction of the teacher. There should be an orchard in which the children may roam. On this estate let the children spend most of their time in play, spontaneous except for the supervision and direction of the teacher.

A part of the time should be spent in kindergarten

exercises. These can be much enriched by the addition of Montessori exercises. The training in self-help, domestic usefulness, and polite behavior should be adopted wholesale from the Montessori system. As much of this kindergarten work as possible should be carried on out of doors when the weather permits. Note that some of this is work and not play. The cultivation of the garden, the setting of the table, dressing, washing one's self, are work, though a well-trained child will find as much enjoyment in them as in play.

Elementary Education. — We should learn from the Montessori system that since our primary and fundamental functions are motor, the greater part of the waking hours of the child should be employed in motor reactions. Our elementary schools have been too bookish. Manual training, domestic economy, agriculture, horticulture, wood lore, athletic and gymnastic exercises must have a larger place in children's life in the future than they have had in the past.

I should like to turn the grade-and-high-school curriculum upside down. Later childhood is the time for acquiring the story element of history and the external facts of science. In childhood we should become acquainted with Abraham and Alexander, Marco Polo and Lincoln, with African elephants and Hindu temples, with chemical reactions and the physical properties of matter. Later childhood is also the time for acquiring the art element (skill, the mechanical memory element) of learning, as languages, spelling, drawing, elements of playing musical instruments, arithmetical computation and the memorizing

of names and dates, personal deportment and social etiquette; in short, what may be called the technique of civilization.

The bookish part of elementary education would appear thus:—

(a) Several languages (at least one more than the mother tongue; the study of these should have been begun in the kindergarten age), literature as advanced as the children can understand, not in homeopathic doses, but read in quantities with very little critical study and explanation.

(b) Volumes and volumes of objective history of every race and age, history rich in story and anecdote, and mostly in the form of biography; also geography and sociography in the form of books of travel and adventure.

(c) The elements of all the natural sciences studied in laboratory, nature, and from books, the emphasis placed on a first-hand acquaintance with nature, and practically no time spent upon recondite scientific laws and classifications.

(d) The technique of civilization including reading, writing, spelling, and the art of computation in arithmetic.

Grammar and scientific arithmetic, definitions, and the scientific systematization of knowledge should be left for the high school.

Secondary Education. — With the main part of the fact side of the sciences and the memory side of languages acquired in the grades, the high school pupil could devote his book time to strictly scientific study. This is the time for scientific study of the elements of

language, literature, mathematics, physical sciences, biology, history, and the other social sciences.

Summary. — Early childhood (up to seven years) is the time for sensory and motor organization and coördination.

Later childhood (seven to fifteen years) is the time for motor training in the technique of civilization and the objective, descriptive study of our environment.

Youth is the time for scientific organization of knowledge, and the preliminary vocational training.

THE FUNCTION OF EDUCATION

Slowly and painfully with many a blunder, man has worked his way upward from primitive barbarism to his present state of culture. Through all the long process it has been the function of the parent and the teacher to transmit the treasure of civilization from generation to generation.

Yet even the highest civilization leaves much to be desired. Above and far ahead gleams our ideal. Would we reach it we must avidly accumulate, and with miserly care hoard the treasures of the human mind, the spiritual estate of human society. And it is the high duty of every educator to transmit this spiritual patrimony undiminished and untarnished.

APPENDIX

THE NERVOUS SYSTEM

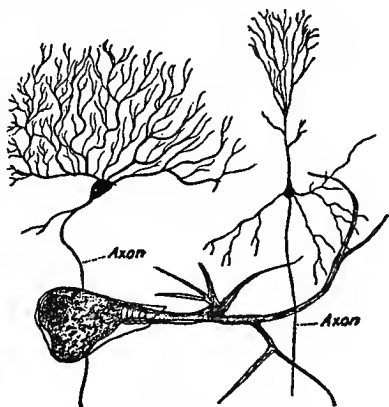
By means of the nervous system the mind controls the body and receives (through the end-organs of the senses) its knowledge of the material world.

The student of this book should have a fair knowledge of the physiology of the nervous system. This appendix is not intended as a substitute for such knowledge, but is meant to give a brief summary of the subject from the psychologist's standpoint.

TISSUES OF THE NERVOUS SYSTEM

The nervous system is made up of structures called *neurons*. A neuron consists of a *nerve cell* with its nucleus and tiny filaments or *nerve fibers* which extend from the cell body.

Wherein the functions of the cell body and its fibers are different, is a matter of some uncertainty. Both are sensitive to stimulation and both possess conductivity. The cell body is known to possess, in addition, nutritive capacities, and is thought to have the power to enforce or inhibit impulses received and even to be capable of automatic action.

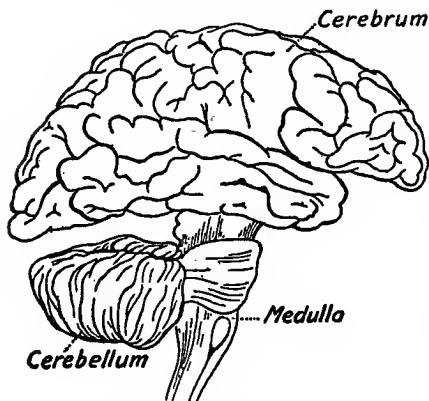


THREE NERVE CELLS

THE CENTRAL SYSTEM

The *central nervous system* consists of two great clusters of nerve centers known as the *brain*, and the *spinal cord*.

The *Brain*. — The brain consists of the *cerebrum*, or the hemispheres which fill the greater part of the cavity of the skull, and the *cerebellum*, which lies behind and below the cerebrum.



THE HUMAN BRAIN

Shown from the side with the cerebrum and cerebellum separated from each other.

The *Cerebrum*. — The cerebrum is divided into a left and a right hemisphere. These hemispheres are united by a band of white matter at the bottom of the dividing cleft. The cerebrum is in form surprisingly like the kernel of an English walnut. Its surface, like the walnut's, is a

series of convolutions. Deeper fissures divide each hemisphere into four lobes—*frontal*, *temporal*, *parietal*, and *occipital*. The deepest fissures are those of *Rolando* and *Sylvius*.

The tissues of the cerebrum are of two kinds. The outside, or *cortex*, is gray matter, between jelly and porridge in consistency, and beneath this is white stringy matter. The greater part of the gray matter is made up of nerve cells, while the white matter consists of nerve fibers, which, as we have seen, are outgrowths from the nerve cells.

The function of the gray matter, whether in the cortex, spinal cord, or other nerve center, is to generate and switch nerve currents. These masses of gray matter have the functions of the batteries in a telegraph line and of the switches in a railroad yard. Neural energy seems to be generated here, and here

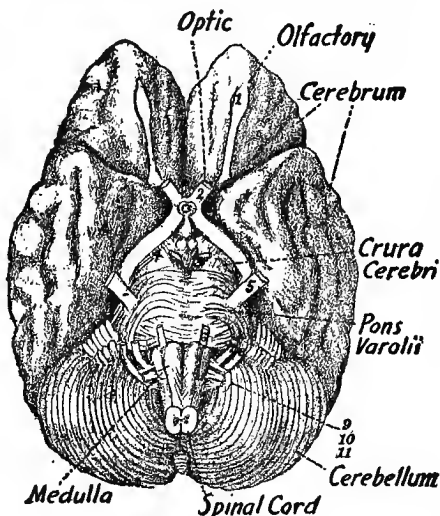
sensory currents are changed into motor currents, and motor currents are sent from one nerve fiber to another.

When a current of neural energy passes through gray matter, it leaves some kind of path behind. We do not know in the least what is the nature of this path except that it becomes easier for the next neural current in the gray matter to travel through the path of its predecessor than to pass where no current has gone before. For every time that a path is traveled it becomes easier of travel for currents. This forms the physical basis for habit, memory, and association.

These neural paths may be likened to a path through a forest, or to the channels of water in a delta. For every animal that passes over the path it becomes more definite and deeper. But if it is left unused, it will finally be overgrown and obliterated.

In fact, it is always becoming effaced, and it must have a certain amount of use to be kept in existence. This plasticity of the nervous system is greatest in childhood and then gradually decreases throughout life, until in extreme old age it sometimes vanishes almost completely. Hence in childhood we learn easily and forget easily, and in old age we may find it impossible to acquire anything new, while our old memories are as intact as ever.

Certain portions of the cortex, or gray matter, of the cerebrum are supposed to be connected with certain sense organs from



THE BRAIN AS SEEN FROM BELOW
The cranial nerves are numbered.

which they receive stimuli. The visual, auditory, olfactory, and tactual *centers* are quite clearly determined; the visual centers in the occipital lobes, the auditory in that portion of the cortex a little above and behind the ear, the olfactory probably in the median lower parts of the temporal lobes, and the tactual along the fissure of Rolando. The centers for taste are not so exactly located, but are thought to be near the olfactory centers. A large group of the cells of the cortex known as the *region of Rolando*, because near the fissure of Rolando, is thought to be in connection with the voluntary muscles. If a portion of this region is injured, as by the pressure of a blood clot, a sliver of bone, or a foreign substance that has penetrated to it, the muscle which has its nerve centers in the injured region becomes paralyzed.

There are also supposed to be in the cortex of the cerebrum, *association centers*, whose function is to unite the various sensory centers.

So interrelated are the sensory centers of the cerebrum, that the loss of the use of one center produces disturbances in other centers. For instance, the destruction of the auditory centers would result not only in a loss of one's power to hear or to remember what had previously been heard, but even in loss of power to speak, provided the person so injured used auditory images in formulating his speech. This crippled condition of a sensory center is called *aphasia*.

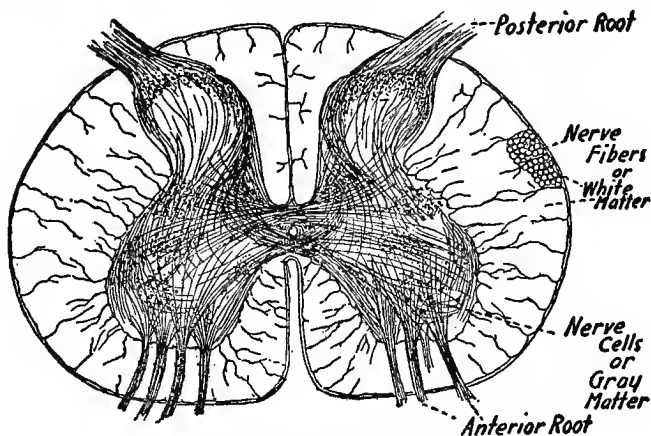
The tissues of the gray matter are constantly wearing out and being replaced. There is evidently an immaterial pattern and force that fits into place according to its own laws the particles of matter as they come and go. And not only is the organic structure of the brain maintained, but the neural paths are also reproduced and perpetuated.

Our clear consciousness is connected only with the neural events of the cerebrum, it is asserted. The other nerve centers are connected with subconsciousness. And with many functions of even the cerebrum our mind is only subconsciously connected.

The Cerebellum. — The cerebellum, like the cerebrum, is made up of gray and white matter. Little is known concerning the functions of this organ, but it is thought to be a

coördinating center, regulating the currents started in the cerebrum, so that the complicated movements necessary to the body in its various activities may be performed in an orderly manner. The cerebellum is also thought to serve as a relay station to strengthen the messages sent out by the cerebrum.

The Medulla Oblongata. — An enlarged portion of the spinal cord just below the cerebellum, called the *medulla oblongata*, is often spoken of as a coördinate part of the nervous system with the brain and the spinal cord. The tissues of the medulla



A CROSS SECTION OF THE SPINAL CORD

The white matter is really filled with nerve fibers, but in the figure these are shown at only one point.

consist of a complex mixture of nerve fibers and nerve cells. Through the fibers, messages are transmitted from the brain down to the spinal cord and in the opposite direction. The cells of the medulla are connected with the control of the respiratory and circulatory organs.

The Spinal Cord. — In the *spinal cord* the arrangement of the gray matter and white matter is the reverse of that shown in the brain; the white matter being on the outside and the gray matter within. A cross section will show the gray matter in the form of a capital H. Two projections point inward and two

point outward. They are called the *anterior* and *posterior* projections respectively.

A very important function of the spinal cord is its power to produce *reflex action*; that is, action in immediate response to sensory stimulation without the direction of the cerebrum. Instances of such action are sneezing, the twitching of the foot when something tickles it, or an involuntary shiver when a cold draft is felt.

Through the spinal cord impulses pass upward and downward from the brain to the sense organs and muscles and from the sense organs and muscles to the brain.

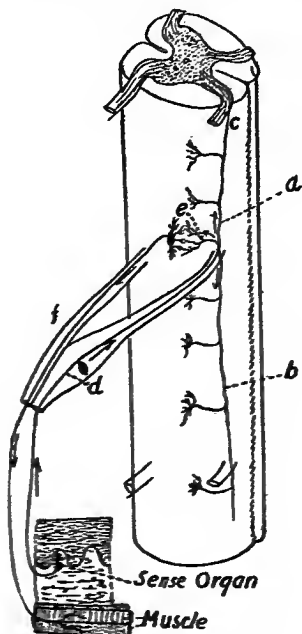


DIAGRAM ILLUSTRATING A SIMPLE REFLEX ACTION

The impulse from the sense organ passes in over the nerve fiber, *d*, and may pass up to the brain over *a-c*. But a part may be switched off through *e* down the fiber *f* to the muscle, causing it to contract without the aid of the brain.

control of the muscles of the face and carry impulses communicated to them by the nose, the eye, the ear, and the tongue.

The spinal nerves branch out from the spinal cord, thirty-one on each side. Each nerve has two roots, one arising from the

THE PERIPHERAL NERVOUS SYSTEM

The central nervous system communicates with the rest of the body by means of a series of nerves and nerve endings known as the *peripheral nervous system*.

There are two groups of these nerves—the *cranial nerves*, which carry messages to and from the brain without entering the spinal cord, and the *spinal nerves*.

The cranial nerves, of which there are twelve pairs, have control

posterior projection of the gray matter, and called the *posterior root*, the other arising from the anterior projection and called the *anterior root*.

By experiment, it has been ascertained that the function of the posterior root is to bear to the spinal cord sensory impulses coming from the various parts of the body; while the anterior roots are concerned with the motor impulses, which are sent out by the brain or spinal cord to the muscles.

The nerves which have to do with incoming or sensory impulses are called *afferent* nerves; those which have to do with outgoing or motor impulses are called *efferent* nerves.

THE SYMPATHETIC SYSTEM OF NERVES

In addition to the central and peripheral nervous systems, there is a series of nerve cells and nerve fibers to which has been given the name of the *sympathetic system*.

This system consists of two strands of nerve tissue, which are found within the cavity of the body, one on each side of the spinal cord. Each strand of nerve tissue is connected with each of the spinal nerves on its side of the cord by a mass of nerve cells.

The sympathetic system has not the power to originate impulses, but can take up impulses communicated to it by the spinal nerves from the brain and spinal cord.

The nerves of this system are thought to have to do with the functions of several of the large organs of the body, such as regulating the action of the blood vessels in the abdominal region, and controlling the secretions of the liver.

As a rule, the impulses which are carried by the sympathetic system are not under the control of the will.

THE FUNCTION OF THE NERVOUS SYSTEM

The function of the nervous system is to *convert stimuli into motor reactions*. The end-organs of the sensory nerves in the different sense organs pick up stimuli for each sense of its peculiar kind. The neural current excited in the nerve, often first passing through several inferior centers, finally lands in

the cortex of the brain in the region appropriate to that sense. Then, if not inhibited by consciousness, a counter current is started which travels out from the brain to some muscle and causes a motor reaction. The motor reaction is specific for each variety of stimuli, and is fixed by instinct unless modified by habit.

In man and the higher animals consciousness can at any time step in and inhibit, delay, or change the kind of motor response.

As we have seen, it is not necessary in all cases for the sensory current to go all the way to the cortex to produce a motor reaction. In habitual actions, and in the fundamental instincts, it seems that a motor current is started from the spinal cord as soon as the sensory current arrives there.

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